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UNIVERSITY OF ALBERTA

Sir Joseph Banks and Commercial Biology: A Motivating Force in British Imperial Expansion During the Late Eighteenth and Early Nineteenth Centuries

by

Michael Richard Snyder

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A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR

THE DEGREE OF MASTERS OF ARTS

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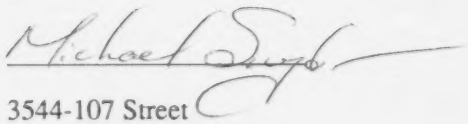

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15 August 1994

I have taken the Lizard, an Animal said to be Endow'd by nature with an instinctive Love of Mankind, as my Device, & have Caus'd it to be Engrav'd as my Seal, as a Perpetual Remembrance that a man is never so well Employ'd as when he is laboring for the advantage of the Public; without the Expectation, the Hope or Even a wish to derive advantage of any Kind from the Result of his exertions.

Sir Joseph Banks

UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled Sir Joseph Banks and Commercial Biology: A Motivating Force in British Imperial Expansion During the Late Eighteenth and Early Nineteenth Centuries submitted by Michael Richard Snyder in partial fulfillment of the requirements for the degree of Master of Arts in History.

Philip Lawson

Lesley Cormack

C. Donald Heth

Burton M. Smith

14 vi 94

Date

Dedicated to the memory of my uncle, Robert Deane (1931 - 1993).

Abstract

While Sir Joseph Banks is best known for his role as botanist on Captain James Cook's *Endeavour* voyage, it was his activities in promoting commercial biology that had the greatest long-term effect on the British Empire. Banks' fame following Cook's first voyage, his friendship with King George III, and his position as President of the Royal Society provided him with significant influence within government and private British institutions. It is the contention of this thesis that Banks' influence was so profound that, as an individual, he contributed significantly to the direction and form British imperial policy took during the five decades between 1770 and 1820. Through the development and application of commercially useful species and the organization of a world-wide network of botanic gardens Banks became a key figure in British imperial expansion. This thesis is divided into three segments. The first examines Banks' early experiences with commercial biology with the aim of providing a contextual basis for his latter ventures in ecological imperial expansion. The second section considers three such ventures in which Banks was involved. The three case studies (the breadfruit expeditions, the establishment of King George III's flock of merino sheep, and the attempted cultivation of hemp for naval stores within the confines of the British Empire) highlight Banks' vision of how commercial biology could enhance the British Empire and the extent to which British institutions (e.g., British government, Royal Navy, East India Company, planter class in the British Caribbean) relied on Banks' guidance and knowledge in matters of ecological imperial expansion. The third segment discusses Banks' patronage in the establishment of a series of botanic gardens. These gardens served four important imperial functions. They promoted the expansion of British territorial borders, served as centres for the discovery and development of new resources, provided a means of promoting the imperial status of Britain through the display of exotic plants, and established a network of inter-connected links for the exchange of natural resources, information, and ideals between widely separated British territories.

I wish to thank my adviser, Dr. P. Lawson for all the guidance, support, and stimulating conversation he has provided me with during the writing of my thesis. In addition, I would like to acknowledge the critiquing and proofreading of this text by Dr. R. Snyder. Finally, a very special thanks with love to Leslie Robertson. She knows why.

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Introduction

"...S[r] Joseph Banks, whose knowledge, Philanthropy, Patriotism & Influence are superior to all others, will be your best assistant."

Mathew Wallen, 1785

Introduction

By the eighteenth century the nature of colonial wealth was changing. The gold and silver of the New World that had fueled the European empires of the sixteenth and seventeenth centuries was giving way to a greater diversity of goods deemed to be valuable. It is a well known axiom that the scarcity of an item determines its value. The European continent held a finite amount of the natural resources vital for the continuation of a nation state's power. After 1750 Britain, for example, required massive amounts of timber to maintain its naval and mercantile vessels, without which the British Empire could not have continued to be a power on the world scene. However, by the eighteenth century the English forests of oak, necessary for shipbuilding, were nearly exhausted.[1] Another source of timber had to be found. There were European suppliers of timber, but political maneuvering and economic uncertainty rendered them unreliable distributors. Britain required virgin forests, preferably ones that the British could oversee and control themselves. During the last three decades of the eighteenth century British authorities considered the timber problem seriously. As European supplies of timber all had their shortcomings the only logical solution was to search out new supplies of timber. In time the British would exploit the extensive forests of Quebec for this purpose without hindrance. However, before the British realized that they already possessed the resources they desired, numerous explorers on a multitude of expeditions were urged to observe vigilantly and catalogue the forests of the world in the hopes that the timber shortage could be solved. This is but one example of the motivation that drove the British overseas expeditions of the eighteenth century. New colonial wealth was required to support the

1. R.G. Albion, "The timber problem of the Royal Navy, 1652-1862," *The Mariner's Mirror*, 38 (1952), p. 4.

Empire, and it was not to be found in items of traditional value. During the 1760s British imperial expansion entered a new age.[2] Because of the growing importance of natural resources, natural historians (biologists in modern terminology) took an increasingly important place alongside the military as advisors concerning colonial possessions.

The most important natural historian in Britain during the five decades between 1770 and 1820 was Sir Joseph Banks.[3] It is the contention of this thesis that Banks' influence was so great that, as an individual, he directed and shaped British imperial policy. He accomplished this through an application of beneficial commercial biology and the development of a world-wide network of botanic gardens during the late eighteenth and early nineteenth centuries.

The first, and most important, area that felt Banks' influence is what has come to be known as commercial biology. Commercial biology generally refers to the development of flora and fauna for either financial, medical, or agricultural purposes. However, while Banks made use of ecological resources for these purposes he also utilized plants and animals for national, or more correctly, imperial, ends. Early in his life Banks recognized

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2. This thesis derives the use of the terms "imperial", "imperial expansion", and "ecological imperialism" from a number of recent works, including A.W. Crosby, *Ecological Imperialism*, (New York, Cambridge University Press, 1986), P.J. Cain and A.G. Hopkins, *British Imperialism* (New York, Longman, 1993), and M. Vicziany, "Imperialism, botany and statistics in early nineteenth-century India: The surveys of Francis Buchanan (1762-1829)," *Modern Asian Studies*, 20 (1986), pp. 625-660. Crosby defines ecological imperialism as occurring whenever a race or group of people modifies or exploits the native ecology (flora, fauna, natural resources, etc.) of a geographical region other than the region they traditionally occupied. According to Crosby (p.82), the "birth year of modern European imperialism" was 1402, when a French expedition took control of Lanzarote, one of the Canary Islands. Cain and Hopkins view imperialism in terms of economic strategies. They see imperialistic actions as integral to the structure of British society and place the beginnings of British imperialism as early as 1688. Vicziany (pp. 627, 633, 635, and 645) maintains that the ecological, geographical, and cultural surveys of Mysore and Bengal conducted by Francis Buchanan in 1800 and 1807, respectively, served political, scientific, and economic ends and hence furthered the imperial cause of the British in India. These references demonstrate a trend in re-defining British imperialist activities. First, imperialism is being seen as existing well before the nineteenth century. Second, imperialism is no longer perceived as referring solely to the acquisition of geographical territories by an Empire. Ecological, economic, and social endeavours are now being viewed from an imperialistic perspective. Therefore, while Banks would more likely have described his application of commercial biology for the advancement of Britain as nationalistic and patriotic, from a historical perspective the nature of his actions can be defined in terms of imperial expansion.

3. Banks was first brought to public attention for his service as botanist on Captain James Cook's famous *Endeavour* voyage (1768-1771). In addition, it was shortly after his return that he became the personal friend and scientific advisor of King George III. Subsequently, Banks would serve the Empire in a greater capacity when elected President of the Royal Society in 1778. In this position Banks acted as an advisor to the British Crown, government, the East India Company, and private citizens on far ranging topics concerning the development and utilization of British imperial possessions.

the wealth and advantage that could be garnered from the plants and animals both inside and outside the borders of the British Empire. Throughout his Presidency of the Royal Society, 1778-1820, Banks actively encouraged the movement of plants and animals deemed beneficial to the Empire between British colonies, and the movement of these valuable natural resources from outside the Empire to within.

In addition, Banks developed a network of colonial botanic gardens patterned on the Royal Gardens at Kew. These gardens served four important functions within British imperial expansion. Through Banks' patronage of the colonial gardens he was able to promote the expansion of British territorial borders through exploration by plant hunters. The discovery and development of new resources (many of them botanical) were a direct benefit of this exploration. By displaying newly discovered, rare, and exotic plants from across the Empire (and even from beyond the Empire) at the gardens a sense of British imperial status was fostered in the public.[4] Finally, the colonial gardens and the Royal Gardens at Kew provided an inter-connected link for the exchange of natural resources, information, and ideals between the widely separated British territories.

Brief Historiography

This thesis will focus on Banks' development of British commercial biology and the significant influence he wielded with regards to British imperial expansion. Over the last thirty years there has been a gradual increase in the awareness of Banks' importance with respect to the Empire's colonial possessions. One of the first full works on Sir Joseph Banks was written in 1911 by E. Smith.[5] It is largely a simple biography of Banks' life, although there is a certain recognition of the importance Banks played as an

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4. Most significant were the elaborate displays of exotic plants which could be viewed in the Royal Gardens at Kew, of which Banks had been appointed the unofficial director in 1772 by his personal friend King George III. In a time before photography or rapid means of overseas transportation, such displays allowed the British public to grasp the extent of the Empire. Plants from New Zealand, Australia, South Africa, the Caribbean, North America, and other British colonies offered graphic examples of the territorial expanse of the Empire to its subjects (and to foreigners).
5. E. Smith, *The Life of Sir Joseph Banks* (U.S.A., Arno Press Inc., 1975 (originally published 1911)).

administrator of British science while he was President of the Royal Society. Indeed, so great was Banks' influence as President that Smith commented, "All over Europe the Society now became scarcely distinguishable from its President."[6] Prior to Smith, references to Banks were restricted to short commentaries based upon remembrances of his term as President of the Royal Society, his time on the *Endeavour* with the celebrated Captain Cook, and amusing anecdotes of his youth.[7] Lord Brougham's chapter on Banks, in his *Lives of Men of Letters and Science* published in 1847, is such a work. In this piece, Brougham recounts details of Banks' life but does not go beyond this level of analysis.[8] In 1952 H.C. Cameron produced a general biography of Banks, similar in many respects to Smith's work.[9] Of greater scholarly significance was the publication of the journal Banks kept while aboard the *Endeavour*, edited by J.C. Beaglehole in 1962.[10] Beaglehole's editing of Banks' journal required an exceptional amount of background research, and his introductory comments on Banks, and on Banks' relationships with persons of power in eighteenth-century Europe, demonstrate that he was quite aware of the international network of communications that Banks maintained through copious correspondences. Several years later A.M. Lysaght followed in Beaglehole's footsteps by publishing an account of Banks' travels and biological work in Newfoundland where Banks visited for a few months in 1766.[11] Lysaght's work is interesting because it provides an image of Banks before he became a man of consequence to the Empire. This work is also of use in that Lysaght included a number of letters written both to and by Banks in the years both preceding and during his Presidency. These letters, reproduced in full, supplement those

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6. Ibid., p. 58.
7. See, for example, Arthur Young's comments on Banks' Lincolnshire estates in his *General View of the Agriculture of the County of Lincoln* (cited in C. Lyte, *Sir Joseph Banks: 18th Century Explorer, Botanist and Entrepreneur* (Newton Abbot, David and Charles, 1980), p. 181) and an article in the *General Evening Post*, 7 January 1772, that recalls a story of Banks being mistaken for a cutpurse while out hunting for insects.
8. H. Brougham, *Lives of Men of Letters and Science, Who Flourished in the Time of George III*, Vol. II (London, Henry Colburn, 1847), pp. 336-381.
9. H.C. Cameron, *Sir Joseph Banks K.B., P.R.S.: The Autocrat of the Philosophers* (Sidney, Angus and Robertson, 1952).
10. J.C. Beaglehole (ed.), *The Endeavour Journal of Joseph Banks 1768-1771*, Vol. I and II (Sydney, Angus & Robertson, 1962).
11. A.M. Lysaght, *Joseph Banks in Newfoundland and Labrador, 1766* (London, Faber and Faber, 1971).

paraphrased by an earlier writer, W.R. Dawson, who collected and compiled a catalogue of much of Banks' extensive correspondence (published in 1958).[12] This catalogue of Banks' correspondence has been invaluable for later historians researching Banks, as his correspondence has become dispersed across the globe, much of it residing in both public and private museums and libraries in Britain, Australia, New Zealand, and the United States, making access to the original documents difficult. Dawson's catalogue opened the door to further studies on Banks, demonstrating the extent of his correspondence with the people who controlled the workings of the British Empire.

Beginning in the early 1970s a number of Australian and New Zealand historians expanded upon Beaglehole's work and began to publish a number of articles focusing on Banks as an agent of British expansionism and the extension of British influence into the South Pacific.[13] This Banksian enthusiasm resulted in C. Lyte's valuable book, *Sir Joseph Banks: 18th Century Explorer, Botanist and Entrepreneur*.[14] Lyte moved far beyond Smith and Cameron in his recognition of Banks' importance with respect to his influence on British expansionism, although the work does occasionally suffer from a pro-Banks bias. The title itself demonstrates how far research on Banks had advanced from the time of Smith's work with respect to recognizing the influence Banks played in British national ventures. Banks was no longer a mere natural historian or administrator, but now an "entrepreneur", developing new horizons in commercial biology for Britain. Interest in Banks' commercial and national endeavours continued through the late 1970s and 1980s (the most recent book on Banks' life being P. O'Brian's).[15] The result was greater research into the importance of commercial biology, overseas expeditions (almost all of

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12. W.R. Dawson (ed.), *The Banks Letters* (London, The British Museum, 1958). Henceforth referred to as *TBL*.
13. See, for example, D. Mackay "Banks, Bligh and breadfruit," *New Zealand Journal of History*, 8 (1974), pp. 61-77; D. Mackay, "British interest in the southern oceans, 1782-1794," *New Zealand Journal of History*, 3 (1969), pp. 125-142; H.T. Fry, "The commercial ambitions behind Captain Cook's last voyage," *New Zealand Journal of History*, 7 (1973), pp. 186-191; and D.J. McGillivray, "Joseph Banks: 'A tolerable botanist'," *Journal of the Royal Australian Historical Society*, 57 (1971), pp. 10-16.
14. C. Lyte, *Sir Joseph Banks: 18th Century Explorer, Botanist and Entrepreneur* (Newton Abbot, David and Charles, 1980).
15. P. O'Brian, *Joseph Banks: A Life* (Boston, David R. Godine, 1993).

which carried trained scientists after 1771), and the nature of British national aspirations, areas in which Banks was particularly influential.[16]

The premise that Banks was a key figure in the development of commercial biology in Britain is by no means new to this thesis. However, in the past there has been little attempt to view Banks' influence and activities in the context of imperial expansion of the British Empire as a whole. To see Banks as only a natural historian, explorer, entrepreneur, or scientific administrator is too limiting. By viewing Banks' contribution to the Empire as a combination of scientific, commercial, and national policies this work strives to focus attention on the multi-faceted nature of Banks' role as a proponent of British imperial expansionism. In this respect, as shall be discussed in the Postscript, this work is in keeping with new trends in interdisciplinary studies in history and offers a new interpretation of the influence of a much-studied man.

Brief Biography of Banks

One of the interesting features concerning Sir Joseph Banks is that his early years were almost completely unindicative of the life he would eventually lead. While he became interested in natural history during his youth, for all intents and purposes Banks was of little renown to any but a few natural historians prior to his involvement in Cook's *Endeavour* voyage. Upon his return to Britain in 1771, after three years of traversing the globe and experiencing the unknown, Banks was suddenly thrust onto the public scene, where he rapidly became the friend and confidant of the highest strata of British society: King George III.

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16. See, for example, L.H. Brockway, *Science and Colonial Expansion: The Role of the British Royal Botanic Gardens* (New York, Academic Press, 1979); D. Mackay, *In the Wake of Cook* (London, Croom Helm Ltd., 1985); G. Williams & A. Frost (eds.), *Terra Australis to Australia* (Melbourne, Oxford University Press, 1988); A. Frost, "New geographical perspectives and the emergence of the romantic imagination", in: R. Fisher & H. Johnston (eds.),*Captain James Cook and His Times* (Vancouver, 1979); H.B. Proudfoot, "Botany Bay, Kew, and the picturesque: Early conceptions of the Australian landscape," *Journal of the Royal Australian Historical Society*, 65 (1979), pp. 30-45; and B. Smith, *European Vision and the South Pacific* (New Haven, Yale University Press, 1985).

Joseph Banks was not born into the aristocracy. Rather, his family came from yeoman stock. While the family line can be traced back to the reign of Henry III, it was not until 1702 that the Banks family fortune in Lincolnshire were firmly established. In this year, Joseph Banks' great grandfather, also named Joseph, bought the Holland Estate for £9,000. In 1714 he purchased the Revesby Estate for £14,000 and made it the family seat. Finally, in 1726 the Marsh Estate was added to the Banks' holdings.[17] Despite this wealth, the Banks family remained largely rural in its outlook, playing an active role in the agricultural affairs of Lincolnshire.

While maintaining a rural perspective, members of the Banks family were not unaware of the greater issues affecting Britain and were active in politics. Sir Joseph Banks' great grandfather was a Member of Parliament for both Grimsby and Totnes, his grandfather a representative for Peterborough, and his father served as a Member for Grampound and was also a Deputy-Lieutenant of Lincolnshire.[18] Oddly enough, Sir Joseph shared none of his family's traditional interest in politics. As Smith said of Banks, "The only notice taken of persons given to social or political unsettling was a somewhat petulant refusal to have any dealings with them whatever."[19] Indeed, this lack of any political aspirations was one of the key factors that allowed Joseph Banks to operate so well within the British administration: he owed political allegiance to no one.[20] George III must have found this particularly refreshing and the two men maintained a close friendship for nearly fifty years, untroubled by party politics.

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17. Lyte, p. 8.
18. O'Brian, p. 15.
19. E. Smith, p. 160.
20. Throughout his association with the King, Banks existed strictly within the circle of George's personal friends. This was not an uncommon position for a courtier to be in following the Glorious Revolution: no longer did a personal association with the monarch necessitate a political agenda. This is not to say that Banks failed to use his friendship with the King to further projects he was involved in. However, the ventures Banks promoted were of importance to British imperial expansion as a whole and, as such, were non-partisan in nature. Banks often replied to petitions he received for assistance with various expeditions that His Majesty's ministers often consulted him on matters of science but that he never meddled in political affairs (e.g., *TBL*, pp. 239 & 286). O'Brian, Banks' most recent biographer, notes that Banks was "a man who had nothing to do with politics, so that he got along perfectly well with Whigs and Tories and even, when they made their appearance, with Radicals" (p. 195).

Thanks to his family connections, Banks moved in influential circles. While still a young boy he became friends with the fourth Earl of Sandwich, a neighboring land owner. Beaglehole commented that Sandwich, already deep in politics and acquainted with the ways of the world, "was to be useful to Banks, and he was, it seems, to form a pretty accurate estimate of some at least of the capacities of his young friend. Sandwich was capable of sharing a botanical expedition and both were passionate fishermen."[21] Banks also made influential friends through his schooling. When he was nine his father decided that a proper education was in order and sent him to Harrow. However, Banks' progress was so appalling that after three years he was transferred to Eton where, although his academic performance hardly improved, he did come in contact with the children of the elite families of Britain. A particularly close school friend of Banks was Constantine Phipps, later Lord Mulgrave, who eventually rose to a high position in the Royal Navy.

For one who was later to become so significant a figure in the scientific realm, Banks' early lack of aptitude for his studies is curious. As Lord Brougham, one of Banks' school friends, was fond of recalling, his "friend Joe cared mighty little for his book, and could not well understand any one taking to Greek and Latin."[22] About the only area of interest Banks developed during his stay at Eton was that of botany. Sir Everard Home (Banks' doctor and personal friend) outlined how Banks came to be interested in botany in the Hunterian Oration in honor of surgery in 1822. Apparently, a year after arriving at Eton, Banks was found by Edward Young, his form master, reading a book, a most unusual pastime for Banks, added Home, who continued,

> This sudden turn which his mind had taken, Sir Joseph explained to me in the following manner; one fine summer evening he had bathed in the river as usual with other boys, but having stayed a long time in the water he found that when he came to dress himself, that all his companions had gone; he was walking leisurely along a lane, the sides of which were richly enameled with flowers; he stopped and looking round, involuntarily exclaimed, How beautiful! After some reflection, he said to himself, it is surely more natural that I should be taught to know all these productions of Nature, in preference to Greek and Latin; but the latter is my father's

21. Beaglehole (ed.) (1962), Vol. 1, p. 7.
22. Brougham, p. 340. Henry Brougham, the author, was the son of Banks' friend, Lord Brougham.

> command and it is my duty to obey him; I will however make myself acquainted with all these different plants for my own pleasure and gratification. He began immediately to teach himself botany.[23]

Regardless of the absolute veracity of this story, one aspect that is certainly true was Banks' self-supervised study of botany. While at Eton, Banks hired women who collected medicinal plants He paid a sixpence for each plant they brought him for which they could describe the properties.[24] When Banks moved on to Oxford his interest in botany went with him. Unfortunately, the Chair of Botany was held by Dr. Humphrey Sibthorp, reputed only to have taught one lecture on the subject in the thirty-five years of his stay at Oxford. Banks approached Sibthorp for permission to engage another, more knowledgeable instructor. Sibthorp provided Banks with a letter of recommendation to John Martyn, Chair of Botany at Cambridge. Martyn, in turn, advised Banks to seek instruction from Israel Lyons, a respected mathematician and qualified botanist who had recently published a *fasciculus* on the flora of Cambridge.[25] Banks hired Lyons to lecture on botany to himself and his friends and, as Lyons was only four years older than Banks, the two began a lasting friendship.

Although Banks' father had died in 1761, it was not until 1764 that Banks came into his inheritance. At this point Banks purchased his own London house on New Burlington Street. It was undoubtedly during this time (1764-1766) that Banks met many new friends who shared his interest in natural history and antiquities. These included Thomas Pennant (17 years older than Banks, Pennant wrote his famous *British Zoology* in 1766 and corresponded with Linnaeus regularly), Daines Barrington (a lawyer and antiquarian), the Reverend John Lightfoot (an admired botanist), Dr. Morton (the librarian of the British Museum), Dr. William Watson (well known for his work in physics and astronomy), Professor John Hope (the Edinburgh botanist), Gilbert White (author of *The*

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23. Cited in Lyte, p. 14.
24. Brougham, p. 339.
25. McGillivray, p. 12. The choice of Lyons was of great importance to Banks' further botanical work for Lyons had adopted the Linnean nomenclature in his book on Cambridge flora and this introduction to the Linnean system won Banks over to the system of classification based on the reproductive organs of plants.

Natural History of Selborne) and Daniel Carl Solander (a Swedish naturalist and student of Linnaeus working in the British Museum).[26] Banks met with many of these men during this period at the *Horace's Head*, a book shop on Fleet Street owned by Benjamin White, the publisher of many of the British books concerning natural history.[27] In addition, Banks lived close to the Chelsea Physic Garden. Spending long hours in the garden gradually gained him the friendship of Phillip Miller, the garden's custodian. Although something of a curmudgeon, Miller was a brilliant botanist and was the author of the classic *Gardener's Dictionary*, a staple reference text for all botanists of the period.[28] Through Miller, Banks gained access to the Garden's large herbarium which exposed him to some of the foreign plants he would encounter during his overseas botanical expeditions.

It was also during this period that Banks left Oxford without completing his degree. Perhaps his thoughts were occupied with greater matters, particularly a planned expedition to Newfoundland and Labrador to study the largely unknown natural history of these regions. Banks and his friend Constantine Phipps (now a Lieutenant in the Royal Navy) were able to book passage on the *Niger*, a Royal Navy vessel patrolling the Newfoundland fisheries, for both the outward and return trips (in this, Banks' connections with Lord Sandwich would have been most useful).[29] In addition, Peter Briscoe (Banks' servant) accompanied them to help collect plants.[30] It was in April 1766, the same month that Banks sailed on his Newfoundland expedition, that Dr. Charles Lyttleton (the Bishop of Carlisle), Dr. Charles Morton, and Dr. William Watson nominated Banks for a Fellowship to the Royal Society although Banks was only twenty-three at the time. However, it was not until 15 February 1767 that he attended his first meeting of the Society as a Member instead of as a guest.[31]

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26. Beaglehole (ed.) (1962), Vol. 1, p. 9; Lyte, p. 18; Lysaght, p. 238, and O'Brian, pp. 33-38.
27. Lysaght, p. 238.
28. P. Miller, *The Gardener's Dictionary* (New York, Wheldon & Wesley, 1969 (originally printed 1754)).
29. Lysaght, p. 46.
30. Peter Briscoe also joined Banks on the *Endeavour* voyage.
31. E. Smith, p. 12.

Banks successfully collected and described a large number of plants and animals during his Newfoundland expedition, aided greatly by the copious instructions on natural history collecting and observing provided him by Solander. Perhaps of greater consequence to Banks, though, was the six weeks he spent in Lisbon during his return voyage on board the *Niger*. While there, Banks met the leading Portuguese scientists of the day, including the botanists Domingo Vandelli and Joao de Luoreiro. Lyte observed that,

> Those meetings with men of science in Lisbon really marked the start of what was to become an important part of Banks's life, that is the international correspondence he maintained with scientists. It was a correspondence that was to grow to mammoth proportions, and cut across the restrictions of diplomatic and inter-government feuding, and even wars.[32]

As was to become even more apparent in the following years, Banks firmly believed that science superseded national boundaries. During his Presidency of the Royal Society he maintained that scientific information and men of science should be allowed free movement.[33]

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32. Lyte, p. 34.

33. Banks' belief that science should be neutral in spite of national politics when compared with his involvement in British imperial expansion provides some of his greatest contradictory actions. By way of example, the following instances demonstrate Banks' belief that science reached across national boundaries. To Guillaume de Bure, a Parisian bookseller Banks wrote "Science should always be at peace" (*TBL*, p. 254 (March 1805)). Banks' reply to Pierre Samuel Dupon de Nemours' request for passports to organize an expedition to Africa was that if the expedition was scientific he would promote it, if political he would take no part in it (*TBL*, pp. 285-286 (11 June 1798) & p. 286 (18 July 1798)). In 1815 Banks recommended to Francis Rawdon Hastings that the French botanist, Leschenault de la Tour, who was being sent by the French government to found a botanic garden at Pondicherry should be given protection and assistance by the British authorities in India (*TBL*, 400 (11 Jan. 1815)). While negotiating for the return of the botanical collection of Jacques Julien de LaBillarière, Banks wrote the French scientist "That the science of two Nations may be at Peace while their Politics are at war is an axiom we have learned from your Protection of Capt. Cook." (*TBL*, p. 906 (9 June 1796)). However, lest we forget, Banks was heavily involved in promoting the imperial expansion of Britain. He arranged for the theft of Spanish merino sheep through his agents in Portugal (Lyte, p. 42), advised Charles Jenkins that Britain should cease exporting potash to the French because the French utilized a process by which saltpeter (a component of black gunpowder) was extracted from potash (*TBL*, pp. 452-453 (13 Feb. 1794)), and was willing to take possession, for Kew Gardens, of certain plants captured in time of war, such as those aboard the *Albion* (*TBL*, p. 565 (22 & 23 June 1798)). It is too simplistic to say that Banks evaluated each situation and only sacrificed his ideal of scientific neutrality when he perceived that the overall security of British ventures were at risk. While not denying that such a thought process could have entered Banks' mind it appears more likely that the degree of his erratic behaviour towards the neutrality of science depended primarily on whether or not an individual (especially someone he knew) or a foreign nation as a whole was involved. Banks valued personal friendships, as can be readily seen in the thousands of letters he exchanged with acquaintances around the world throughout his life. When friendship was involved it seems that science was most often neutral for Banks.

Buoyed up by the success of his Newfoundland expedition Banks soon set off again, this time into the mountains of Wales and the western reaches of England. Accompanied by William Hudson, author of *Flora Anglica*, Banks spent from August 1767 to January 1768 traveling the countryside increasing his knowledge of natural history and collecting specimens from the field.[34]

Soon after his return to London Banks discovered that the position of natural historian on the expedition being sent to the South Seas to observe the 1769 transit of Venus across the face of the sun had become vacant. Alexander Dalrymple, the member of the Royal Society scheduled to hold the position, had withdrawn from the expedition due to a conflict with the Admiralty over the command of the voyage. As the expedition had originally been proposed and planned by the Royal Society, it was easy enough for Banks, a Fellow with a demonstrated wanderlust (and substantial wealth), to volunteer for the position. Thus, the Admiralty was informed that Joseph Banks, FRS, and a "gentleman of large fortune", would be joining the expedition and would serve in the capacity of natural historian.[35] Banks' suite, along with his baggage and instruments of science, included seven other men. While two were Banks' personal servants, the other five were trained natural historians, painters, and draughtsmen.

The *Endeavour*, commanded by Captain Cook, with Banks and his accompanying scientific contingent, sailed from Plymouth Sound on 25 August 1768. They reached Tahiti with little mishap and successfully viewed the 3 June 1769 transit of Venus. After the completion of this task, the official reason for the voyage, Cook turned to his sealed orders which instructed him to search for *Terra Australis Incognita*, the Great Southern Continent. For a variety of reasons, the most popular being the global counter-balance theory, it was believed by many that there had to be a super continent somewhere in the

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34. McGillivray, p. 14.
35. Cited in O'Brian, p. 64.

southern hemisphere.[36] Two previous British expeditions sent to the southern hemisphere had failed to discover this landmass. Cook's orders directed him to a poorly explored region. While Cook did not discover *Terra Australis Incognita*, he did prove that New Zealand is comprised of two distinct landmasses and, more significantly, discovered the eastern coast of Australia, claiming the continent for Britain.

Banks and his assembly of assistants spent the entire voyage collecting plants, animals, and artifacts manufactured by the inhabitants of the regions to which they traveled. In addition, Banks proved to be an accomplished amateur anthropologist and demonstrated a facility to learn the languages of the people met by the *Endeavour's* crew. While the details of the voyage need not be reviewed here, it may be said that the expedition was a success and the officers, scientists, and crew were regarded as heroes upon their return to Britain, 12 July 1771. Less than a month after their return, Cook, Banks, and Solander were presented to King George III by John Pringle, President of the Royal Society. This was to be the beginning of Banks' lifelong friendship with the King.

The success of the expedition soon led to talk of organizing a second voyage to continue the discoveries of the *Endeavour*. Cook was again to command and Banks to serve as the expedition's chief natural historian. Banks promptly set to work, acquiring equipment and assistants, and suggested several modifications to the *Resolution*, the ship chosen for the expedition. Unfortunately, Banks was a better botanist than nautical engineer. The modifications he demanded made the ship too top heavy to be seaworthy. When the *Resolution* was returned to its original state, contrary to Banks' wishes, he flew into a rage and withdrew from the expedition.[37] The *Resolution* sailed without him and Banks had to contend himself with a privately planned expedition to Iceland.[38]

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36. See A. Dalrymple, *A Historical Collection of the Several Voyages and Discoveries in the South Pacific Ocean* (New York, Da Capo Press, 1967 (originally published 1770)), pp. 12-20 for an account of the rationale behind the belief in *Terra Australis Incognita*.
37. Beaglehole (ed.) (1962), Vol. I, pp. 73-81.
38. See U. Troil, *Letters on Iceland: Containing Observations on the Civil, Literary, Ecclesiastical, and Natural History; Antiquities, Volcanos, Basaltes, Hot Springs: Customs, Dress, Manners of the Inhabitants, &c. &c. Made, During a Voyage Undertaken in the Year 1772, by Joseph Banks, Esq. F.R.S.* (London, J. Robson, 1780).

Upon his return from Iceland, Banks threw himself into the organization of the items brought back from the *Endeavour* voyage. In particular, he oversaw the painting of plates depicting the flora and fauna discovered during the expedition.[39] In addition, in 1772 George III made Banks the unofficial Director of the Royal Gardens at Kew. This position had become vacant after the death of the Dowager Princess and the withdrawal of Lord Bute from public life. This event marked the end of Banks' time as an explorer, as he became more and more of an administrator, not only of the Royal Gardens, but of his personal, yet very extensive, library and museum based in his house at Soho Square. His home quickly became a gathering point for natural historians eager to view his collection or meet with other similarly minded men to discuss aspects of science. Banks' name was rapidly becoming famous throughout the scientific community of Europe.

When Sir John Pringle resigned as President of the Royal Society in 1778 Banks was nominated as successor. The only other contender was Alexander Aubert, a wealthy London merchant and amateur astronomer. Although only thirty-five, Banks had been a Fellow since 1766 and had served on the Council during 1774 and 1775. In addition, Banks had achieved public recognition from his participation on the *Endeavour* voyage, was politically non-partisan, and maintained a close personal friendship with the King. The combination of these factors resulted in Banks being elected to the Presidency by an overwhelming majority. He served in this capacity for the next forty-two years, until his death in 1820.

While Banks cared little for the day-to-day workings of the Royal Society he was a competent administrator and only missed 33 out of 450 meetings during his term as President. He created some uproar in the Society through his insistence that anyone, regardless of wealth, should be admitted as a Fellow to the Society provided they engaged in scientific studies, particularly original research. Banks wanted rich patrons who did not contribute directly to scientific pursuits screened more closely, fearing that the Society

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39. O'Brian, p. 60.

would degenerate into an idle club for the rich, useful only as a status symbol. In addition, Banks helped found the Linnaean Society, devoted to natural history, and after it was decided that future societies would be subservient to the Royal Society, Banks backed the Royal Institution, the Astronomical Society, the Geological Society, the Society of the Arts, the Engineers' Society, the Dilettanti Society, the Society of Antiquaries, the Horticultural Society, and the Society for the Improvement of Naval Architecture.[40] He also published an occasional account of his research in the Royal Horticulture Society's pamphlets.

Once President of the Royal Society, Banks' level of correspondence increased manyfold. Through his overseas connections he was able to begin a policy of commercial biology, importing foreign plant species to the Royal Gardens at Kew. The Royal Gardens became something of a clearing house which redistributed the plants to British colonies best suited for large scale agricultural development of the various valuable species. In addition, relying on his influence as President of the Royal Society and his close ties to members of the Admiralty, the East India Company, and the Board of Trade, Banks was able to send plant collectors wherever British ships sailed. While the expenses of these plant collectors were usually paid by the government or the East India Company, it was not unheard of for them to draw bills directly on Banks.[41] These young men, sent out under the direction of the Royal Gardens at Kew, would either join voyages of exploration, collecting flora and fauna as part of the expedition, or take passage on a British ship and disembark to collect specimens privately, sending them back to the Royal Gardens whenever they were able. In this way the Royal Gardens acquired over 7,000 new species during Banks' term as Director, many of which, after study, were dispatched to British overseas colonies deemed

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40. Lyte, pp. 206-207 and O'Brian, p. 280.
41. For example, when Adam Afzelius, a botanist collecting in Free Town, had his equipment destroyed during an attack by the French, Banks honoured any bills drawn on Afzelius and dispatched new equipment, TBL, (17 Feb. 1795 and 13 July 1795) pp. 7-8. In addition, George Caley's botanical collecting in Australia was financed by Banks (see *TBL*, pp. 489-490 (13 Dec. 1798) and W. Blunt, *In for a Penny: A Prospect of Kew Gardens: their Flora, Fauna and Falballas* (Worcester, Hamish Hamilton, 1978), p. 68). On a more personal level, it must be remembered that it was Banks himself who financed the biological component of the *Endeavour* voyage.

best suitable for growing them.[42] In addition to his other duties Banks became an important consultant to the East India Company, offering a variety of advice concerning not only flora and fauna but also anthropological information. Because of Banks' copious overseas correspondence, those who came to him for advice gained the benefits of knowledge accumulated by a number of scientists scattered across the globe.

In recognition of his contributions to the British Empire, Banks was made a Baronet in 1781 and received the Red Ribbon of a Knight of the Order of the Bath in 1795. Banks' very real friendship with the King was a great asset to various projects he was involved with. Banks found it far easier to organize expeditions, for example, when bureaucratic delays could be avoided simply by strolling through the Royal Gardens with the King and discussing the matter at hand. George III was well aware of the importance science could play in benefiting and expanding the British Empire. Although occasionally ridiculed as "Farmer George", the British monarch took the sciences seriously.[43] Peter Collinson, a noted natural historian and antiquarian, wrote to William Bartram in February 1768, "I wish the King had any taste in flowers or plants but as he has none, there are no hopes of encouragement from him, for his talent is in architecture."[44] Despite Collinson's assertion, George III did have interests other than architecture, principally agriculture and livestock.[45] The King did, however, come to take an interest in botany, at the very least because of his wife's fascination with flowers. For example, following the death of Reverend John Lightfoot, a close friend of Banks and author of *Flora Scotica* (1777), the King purchased his important herbarium as a gift for his wife.[46] It is unclear just how closely Banks and George III planned projects together, for they spoke personally more often than they corresponded, leaving little historical record. Nevertheless, there are some indications that Banks and George worked closely together on a number of endeavours that

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42. Blunt, pp. 59-60.
43. O'Brian, p. 181.
44. Ibid., p. 55.
45. Ibid., p. 57.
46. Ibid., p. 57.

benefited the British Empire. The "Patriotic Plan", in which George and Banks sanctioned espionage activities to steal Royal Merino sheep away from the Spanish, was perhaps the most famous.[47] Other notable projects in which Banks was involved, either with or without the close participation of the King, included the foundation of the penal colony at Botany Bay on the eastern coast of Australia, the Breadfruit Expeditions led by Captain Bligh (the first of which resulted in the infamous mutiny on the *Bounty*), Captain George Vancouver's voyage of discovery to the west coast of North America, the development of gardens at Calcutta, St. Vincent, and the Barbados, and the preparation of a shipment of plants sent from the Royal Gardens at Kew to the Russian Empress as a demonstration of friendship between Britain and Russia. So it was that Banks continued to play a significant role in British imperial strategy until the time of his death on June 19, 1820, only a few months after that of George III, his friend of nearly fifty years.

Organization of Thesis

The body of this thesis is organized into three chapters. As noted above, the position taken throughout this work is that Banks was a powerful force in British imperial expansion from the 1770s to his death in 1820. Banks' greatest contributions to his country were due to his policies of commercial biology, which saw the utilization of plants and animals for economic and political ends.

The first chapter concentrates on the formative events in Banks' early life that were responsible for his realization of the importance commercial biology could have to the British Empire. These early experiences are significant for understanding Banks' later activities, for they were pivotal in shaping the attitudes that motivated him during his time as President of the Royal Society. Banks had met a number of respected natural historians during his time at Oxford who conveyed to him the concept that humanity could benefit from new discoveries of the natural world. However, it was not until Banks conducted his

47. Lyte, pp. 183-184.

own field work during his expedition to Newfoundland and Labrador that he began fully to appreciate how many untapped resources were available from the natural world. While taking part in the *Endeavour* voyage the conviction that Britain could benefit tremendously by proper utilization of commercial biology became firmly entrenched in Banks' mind. It was this realization that was to remain central to his later dealings. The chapter also briefly examines the status of science in Britain during the mid eighteenth century which made Banks' plans of commercial biology possible to fulfill. Recognizing the importance of King George III on Banks' life the chapter concludes with a brief review of George's attitudes towards botany and his interest in the Royal Gardens at Kew.

In the second chapter several specific examples of how Banks applied commercial biology to benefit the British Empire have been selected for examination. Banks' role in the Breadfruit Expeditions, the British attempt to rear the Spanish Merino sheep, and an effort to cultivate hemp to provide cordage and rigging for the British Royal Navy and mercantile fleet is investigated, demonstrating not only Banks' own pivotal role in imperial endeavours but also the increasing value placed upon commercial biology by the British government. To a certain extent the attention devoted to projects involving biological resources by the government was due to Banks' influence. Following his appointment as unofficial director of the Royal Gardens at Kew and his election as President of the Royal Society Banks began to work more and more closely with the British government, although he maintained a non-partisan attitude towards Whig and Tory alike. By the beginning of the nineteenth century Banks, originally an obscure natural historian, had become the principle consultant of the government on all matters concerning commercial biology and was, by and large, such a familiar figure in issues concerning British imperial development that his participation was almost taken for granted.

The third chapter looks at one of the culminating achievements of Banks' long involvement in British imperial policy: his patronage of scientific gardens both in Britain and in the British colonies. Banks' activities as the unofficial director of the Royal Gardens

at Kew are relatively well appreciated. He ensured that the Royal Gardens were organized in a scientific manner and used the Gardens as a sort of international clearing house for newly discovered plants. Less appreciated, but equally important, was Banks' participation in the establishment, organization, and maintenance of the colonial gardens. The Calcutta Garden has been specifically selected as an example of Banks' role with respect to a colonial garden. In the colonial gardens Banks saw the opportunity for four aspects of imperial development which he deemed especially important to Britain. Banks maintained that gardens, especially those located in the colonies, could serve as resource centres for further exploration, discovery, and expansion. The gardens also provided ideal facilities for the acquisition and development of new botanical resources as well as being displays of imperial prosperity and status. Finally, the gardens, both those in Britain and in the British colonies, served to foster a sense of interconnection between the widely separated elements of the British Empire. At heart, Banks firmly believed in the correctness of the British system and desired to see British ideals (social, political, commercial, and the like) spread throughout the world. In this regard Banks was an expansionist. His patronage of, and influence with, the British network of gardens was a culmination of his belief that commercial biology would benefit British imperial expansionism.

Banks' Spelling and Grammar: A Warning

As mentioned, Banks was never particularly adept in his early academic studies. Consequently, his spelling takes on a most creative flavour. Throughout this thesis an attempt has been made to use original documentation as much as possible. In addition, where quotations are used they are, wherever feasible, transcribed in their original format. The result of this, however, is some rather unorthodox usages of spelling and grammar, especially when Banks is involved. By way of warning, Banks often spelt words quite

differently, even within the same paragraph. He rarely used punctuation and the best one can say of his utilization of capital letters is that it was slightly better than random (although he did demonstrate a marked tendency to capitalize the vowel E and several consonants). Furthermore, Banks often substituted phonetically similarly sounding consonants for one another (particularly C and S). This makes, to say the least, for entertaining reading.

Natural Riches: Banks' Recognition of the Value of Commercial Biology to the Empire and the Resources Available to Him

Introduction

There is no question that by the mid 1770s Sir Joseph Banks was an influential man. He was the personal friend and confidant of King George III, President of the Royal Society, and advisor to the Board of Trade and the East India Company. Banks conversed with foreign heads of state, diplomats, and scientists, and acted as a patron of both British and foreign explorers, natural historians, and inventors. His advice and aid was sought not only for private ventures, but for important matters of state. By the last decade of the eighteenth century Banks had become one of the most influential men in Britain with respect to determining the direction and policies of the Empire's overseas possessions, commercial ventures, and exploration. It was the resulting fame generated by the success of the *Endeavour* voyage that was responsible for bringing Banks into the public eye, the direct result of which was his introduction to, and initiation of friendship with, King George III. Banks' association with the King provided him with great opportunities, such as the Directorship of the Royal Gardens at Kew. However, Banks' connection to the King was not sufficient to give him the influence he would come to wield in British imperial expansionist policy during the late eighteenth and early nineteenth centuries. Rather, it was the skills, experiences, and social connections Banks had gained prior to his return to Britain in 1771 from the three year voyage of discovery that would give him the necessary background for his later activities in commercial biology aimed at enhancing British influence on the world scene through ecological imperialistic policies.

Although Banks did not cease to improve his scholarly abilities and social connections after the return of the *Endeavour* in 1771, it should be recognized that it was his experiences during the prior decade that largely determined his future beliefs concerning the importance of commercial biology to the British Empire. Similarly, Banks' familial ties, his schooling, and his early association with important British natural historians were significant in influencing his later actions and policies. This chapter will examine aspects of Banks' life up to and including the *Endeavour* voyage that will help to explain his later

devotion to advancing British expansionism through commercial biology. Of course, Banks did not exist in a vacuum. Therefore, some consideration will be given to the status of science in Britain at this time. In addition, King George III's interest in natural history and the resulting impact on the Royal Gardens at Kew must be considered due to the close relationships Banks maintained with George and the Royal Gardens during the last fifty years of his life.

Banks' Patronage Network

While Banks was an able scientist and superior administrator there were several other factors that contributed to his rise to prominence, not the least of which were his connections with prominent people. Although not of the aristocracy, Banks' family was wealthy and commanded a certain amount of influence. The Banks' properties in Lincolnshire were primarily devoted to agriculture, however there was also a long tradition of family involvement in local and national politics. This resulted in the Bankses having a close familiarity with regional and international events. In addition, Banks' father, perceiving a proper education to be important, sent Joseph to the most prominent schools. Despite a poor academic performance while at Harrow and Eton, the friendships Banks made with the children of the British elite were, perhaps, more important in the long run than his grades. Many of Banks' life-long friends, including Lord Brougham and Constantine John Phipps (Lord Mulgrave), were Etonian schoolmates.[1]

Banks also made influential friends away from school, such as John Montagu, the fourth Earl of Sandwich, who held property adjacent to that which Banks purchased near Chelsea after his father's death in 1761. Despite the great difference in their ages the two began a very real friendship that was to endure through some especially turbulent incidents

1. Constantine John Phipps (1744-92), later the second Lord Mulgrave, was one of Banks' closest friends and his companion during the Labrador and Newfoundland expedition. Phipps had gone to Eton with Banks but left in the winter of 1758-59 to become a cadet in the Royal Navy. By 1762 he was a lieutenant in command of the sloop *Diligence*. Four years later he was elected Member for Lincoln, but continued his successful naval career, eventually achieving the rank of Admiral. He made one voyage of discovery in 1773, an attempt to find a passage to the North Pole.

and was to prove of great value to Banks once he began his global travels.[2] In addition, Sandwich was also a member of the Royal Society. While not as scientifically inclined as Banks would come to be, Sandwich had enough of an appreciation for natural history that he could appreciate many of Banks' plans and was willing to support his proposals to the Admiralty.

Lord Sandwich was not the only neighbor with whom Banks maintained a friendship, although he was undoubtedly the most influential. John Monson, the third Baron Monson, for example, was a landowner in Lincolnshire with whom Banks maintained ties.[3] In addition to such neighbors, Banks benefited from family relations. His father's sister, Margaret, married the Honorable Henry Grenville. She also maintained a friendship with the Duke of Cumberland. Her daughter, Louisa, married the third Earl of Stanhope. On his mother's side his aunt, Hannah Sophia, was the wife of the eighth Earl of Exeter.[4] While it is impossible to judge the extent to which these family connections aided Banks, they do serve to demonstrate that even before his return from the *Endeavour* voyage he was not without some measure of familiarity with the British elite.

As with his time at Harrow and Eton, Banks' time at Oxford provided him with equally valuable acquaintances and friends, although they were, by and large, of a different class and nature than those he had made in the past. Although Banks had developed his interest in botany at Eton, it was not until he took up his university studies that he began to meet men who took a serious interest in the study of natural history. It was during this time that Banks fell in with a group of natural historians and antiquarians who met regularly

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2. The bitter accusations that Banks hurled at the Admiralty after his withdrawal from Captain Cook's second voyage strained his friendship with Sandwich severely. Banks had demanded alterations be made to the *Resolution* to accommodate the large staff he wished to take with him. When it was discovered that these alterations rendered the ship unseaworthy they were removed. Sandwich, then First Lord of the Admiralty, was the unfortunate recipient of several long diatribes by Banks complaining of his mistreatment. When Banks threatened to make his complaints public Sandwich wisely, and calmly, cautioned him against such a course of action. Fortunately for Banks, Sandwich realized that his young friend was prone to exceptionally intense, if short-lived, bursts of anger, and their friendship continued until Sandwich's death in 1792. For an account of the dispute over the *Resolution* see Beaglehole (ed.) (1962), Vol. I, pp. 73-81.
3. *TBL*, p. 616.
4. Lyte, p. 18.

at the *Horace's Head*, a Fleet Street book shop and publishing house owned by Benjamin White.[5]

The men who frequented the *Horace's Head* were, by and large, older and more experienced than Banks. One can easily imagine the young Banks eagerly listening to their conversations concerning the taxonomic system for plants recently devised by Linnaeus.[6] Certainly their discussion benefited from the presence of Daniel Carl Solander, a Swedish naturalist and favoured student of Linnaeus. Solander, in London working at the newly founded British Museum, was a fountain of knowledge for Banks. Besides being an expert on the most recent advancement in botanical nomenclature, Solander possessed practical knowledge concerning the collection and identification of flora and fauna samples that Banks lacked. Listening to his new friends, Banks must have realized that the only way to progress beyond an amateur's study of natural history, a popular pass-time (along with collecting items of antiquarian value) for the idle rich during this period, was to engage in field work. To this end Thomas Pennant, the Reverend John Lightfoot, Professor John Hope, Philip Miller (in charge of Chelsea Physic Garden), and Daniel Carl Solander provided Banks with careful instructions for the collection of natural history specimens that would serve him well throughout his life.[7]

The influence the natural historians from the *Horace's Head* had on Banks was immeasurable. While they were Banks' friends, in many respects he served an apprenticeship under them. It was not a real apprenticeship, of course, although such a practice had been the traditional manner in which botanical knowledge was disseminated in Britain, but a relationship in which Banks gained the experience and wisdom of a number

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5. See the Introduction of this work for a brief account of the men Banks associated with at the *Horace's Head*.
6. Carl von Linnaeus (1707-1778) developed a binomial system (i.e., the use of both a genus and species name) of classification for plants and animals, a great advancement over previous taxonomic systems. His most famous work, *Systema Naturae* (first published in 1735) went through sixteen editions during his lifetime. The tenth edition (1758) introduced the taxonomic groupings, still used today, for biological nomenclature.
7. Lysaght, p. 45-46.

of men who had already demonstrated their abilities in the field of natural history.[8] Once Banks had decided that he had learned enough natural history from books, Israel Lyons at Oxford, and the various frequenters of the *Horace's Head*, he determined to take himself out into the world to study his chosen career, natural history, firsthand. Not satisfied with collecting specimens from familiar ground, Banks determined to travel to Labrador and Newfoundland, substituting this adventure for the Grand Tour of the European continent traditionally taken by young gentlemen. It was during his time in North America that Banks' nomination for a Fellowship to the Royal Society was approved.[9] The fact that Banks was nominated to the Society at such an early age (he was twenty-three) and without yet having contributed to the study of science is interesting. Perhaps those men who nominated Banks were suitably impressed with his bold choice of Labrador and Newfoundland as his first large scale collecting expedition.[10] Regardless, Banks was elected to the Royal Society, an action that would, ultimately, result in his joining the *Endeavour* voyage and eventually elevate him to the role of the pre-eminent British advisor on commercial biology.

The Labrador Voyage

Banks' expedition to Labrador and Newfoundland in 1766 was to be the first of his overseas voyages. While he was not traveling uncharted waters, as he would on the *Endeavour*, the eastern coast of Canada was still largely unknown from a biological perspective. Banks and his Eton school friend, Constantine John Phipps, who became a

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8. Prior to the eighteenth century botany was rather a mysterious field of study in England, largely controlled by the Apothecaries Guild. The Guild conducted field trips during which its apprentices learned how to identify and collect the plants valued in medicine. See F.D. Drewitt, The *Romance of the Apothecaries' Garden at Chelsea* (London, Chapman and Dodd, 1924), p. 7-11. While the Apothecaries Guild decreased in importance during the eighteenth century, the Apothecaries Act of 1815, which required anyone wishing to practice medicine to study botany, revived the study of plants in their natural setting, if not the Guild itself (D.E. Allen, *The Botanists: A History of the Botanical Society of the British Isles Through a Hundred and Fifty Years* (Winchester, St. Paul's Bibliographies, 1986), p. 6).

9. E. Smith, pp. 10 & 12.

10. Ibid., p. 10. Smith indicates that Banks may have been the "first young man of fortune who was induced personally to take the hazards" of collecting plants in largely unknown territories.

Lieutenant in the Royal Navy in 1762, spent six months during 1766 in Labrador and Newfoundland. Based on the extreme energies Banks dedicated to studying the local flora and fauna, it is apparent that his main goal during the trip was to put his knowledge of natural history to work. He collected all manner of plant and animal species that he could find, some of which proved to be unknown before this time.[11] Banks' expedition to Labrador and Newfoundland served as a rehearsal, of sorts, for the *Endeavour* voyage. During the 1766 expedition he gained valuable skills in collecting, identifying, and preserving biological specimens. In addition, his time in North America exposed him to the commercial potential available from nature. The journal Banks kept during his expedition provides hints that he was considering the importance of colonial natural resources to Britain.[12]

The most obvious commercial product in the region was fish. However, while Banks was impressed with the variety and number of fish being caught he was particularly bitter over the amount of fishing carried out in the region by French vessels. For instance, when he visited the harbour at Inglie he noted that there were twice as many French as English vessels moored there, adding that, "the French indeed have almost the Sole Possession of the Fishery in this Part of the Island Many Harbours here (St. Julian's for instance) not having so much as one Englishman in them..." He was forced to conclude that the French must "Value and Encourage the trade more than we do sending out infinitely Larger ships & Employing more hands in the Trade."[13]

Besides the fisheries, Banks determined that there were a number of other animals and plants that had commercial applications. He listed several species of birds that he found to be fine eating. In particular, he mentioned that the wild geese were far fatter than the domesticated variety in Britain.[14] Also, Banks was introduced to a local drink made

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11. Banks returned to Britain with specimens of some 340 plants, 91 birds, numerous fish, invertebrates, and some mammals (O'Brian, p. 58).
12. Banks' journal is reproduced in Lysaght.
13. Lysaght, p. 127.
14. Ibid., p. 138.

from the syrup from the berries of maidenhair (*Gaultheria hispidula*) that was used as a substitute for tea.[15] At one point he commented on the discovery of a great quantity of whale bone. The bone had been unearthed during excavations on Esquimaux Island the year before his arrival. The whale bone had rotted, but Banks was told that had it been fresh it would have fetched a price of some £20,000.[16]

Such incidents as these demonstrated the benefits and profits that could be garnered through a proper usage of local plants and animals. Although Banks did not discover any new species that he deemed to be of commercial value while in Labrador and Newfoundland, it is apparent that he was aware of the potential for such discoveries. This awareness would find practical application during his next voyage. His time in Labrador and Newfoundland primed Banks for seeking out flora and fauna that could have commercial potential while on the *Endeavour* voyage.

The *Endeavour* Voyage

Though Banks must have had a notion of the possibility of discovering species of plants and animals that would be beneficial prior to the *Endeavour* voyage, it was not until his involvement in the expedition that he came to appreciate the vast resources of flora and fauna available to the British. While his expedition to Newfoundland and Labrador had suggested possibilities, the tropical climates through which the *Endeavour* traveled provided Banks with a much more tangible realization of the diversity of natural resources across the globe. Once given the opportunity, Banks availed himself fully of the possibilities that presented themselves and began to ponder the implications for commercial applications of the biological specimens he collected. For example, when the ship stopped briefly at Porto Santo and Maderia, Banks eagerly went ashore, to speak with Dr. Heberden (a doctor whose brother Banks knew of from London) about a commercially valuable type of wood. Banks indicated in his journal that during their meeting he

15. Ibid., p. 122.
16. Ibid., p. 131 & p. 167 (n.109).

> tryed here to learn what Species of wood it is which has been imported into England, and is now known to Cabinet makers by the name of Madeira mahogany, but without much success, as we could not learn that any wood had been exported out of the Island by that name; the wood however of the tree calld here Vigniatico, *Laurus indicus* Linn. bidds fair to be the thing, it being of a fine grain and brown like mahogeny, from which it is dificult to distinguish it...[17]

Maderia was a Portuguese colony. If Banks could discover the source of the imported wood it would be possible to procure seeds and attempt to cultivate the tree in Britain, perhaps eventually alleviating the need to import it. However, it appears that Banks was unable to procure any such seeds as the "season of the year was undoubtedly the worst for both plants and insects...",[18] although he did collect samples of the Vigniatico tree.[19] This would allow future naturalists to identify it with greater ease, in the event that another British expedition would pass through Maderia at a more favorable time of year.

Only a month into the voyage, and still in relatively familiar waters, Banks scooped from the ocean some *Janthina janthina*, a floating shellfish. He carefully recorded in his journal that

> Each shell contains within it about a teaspoon of Liquid, which it easily discharges on being touched, this is of a most beautifull red purple colour and easily dies linnen clothes; it may be well worth inquiry whether or not this is the *purpura* of the ancients as the shell is certainly found in the Mediterranean.[20]

Banks noted that while he had not yet collected enough of the shellfish to test the dye properly, he expected that he would be able to do this relatively shortly. In fact, this was not the source of the famous Tyrian purple, now known to be derived from *Murex trunculus*. As *Janthina* is only sporadically found at sea it is unlikely that it was ever used consistently as a dye. Regardless, Banks clearly intended to attempt to make use of *Janthina* for this purpose. However, he made no later mention in his journal of carrying out further tests on the properties of *Janthina* and one would suppose that he never

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17. Beaglehole (ed.) (1962), Vol. I, pp. 160-161.
18. Ibid., Vol. I, p. 159.
19. Ibid., Vol. II, p. 284.
20. Ibid., Vol. I, p. 171.

successfully collected enough of the shellfish to do so. Nevertheless, it was apparent that he considered that *Janthina* could prove to be a new valuable resource in the dyeing of textiles.

Banks' interest in dyes persisted throughout the voyage. While synthetic dyes exist in abundance today, during the eighteenth century all dyes were produced from minerals, plants, or animals. In addition, there was a vested British interest in developing unique new dyes as English textiles had traditionally been shipped to the Netherlands to be dyed. The textiles were then transported back to England from where they were subsequently marketed to prospective buyers either in Britain or abroad. The discovery of new dyes had the potential to alleviate the British textile industry's dependence on the Dutch middlemen.

Upon reaching Tahiti Banks was impressed with the red dye used to color Tahitian cloth. He also noted the yellow, black, and brown dyes, but was not as pleased by their colours. The red, however, "is most beautifull, I might almost venture to say a more delicate colour than any we have in Europe, approaching however nearest to Scarlet..."[21] He learned that the red dye was produced by combining the juices of two plants, *Ficus tinctoria* and *Cordia Sebestena orientalis*, "neither of which in their separate state have the least tendency to the colour of Red..."[22] Banks carefully devoted several pages in his journal to the method by which the juices of these plants were extracted and mixed in order to produce the bright red dye.[23] He concluded that,

> Of what use this preparation may be of to my Countreymen either in itself or in any hints which may be drawn from an admixture of vegetable substances so totally different from any thing of the kind that is practis'd in Europe, I am not enough vers'd in Chymistry to be able to guess, I must however hope that it will be of some.[24]

Banks was well aware of the importance of plants to the procedure of dying cloths, noting that

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21. Ibid., Vol. I, p. 356.
22. Ibid., Vol. I, p. 357.
23. Ibid., Vol. I, pp. 357-359.
24. Ibid., Vol. I, p. 359.

> The latent qualities of vegetables have already furnishd our most valuable dyes; no one from an inspection of the Plants could guess that any coulour was hid under the herbs of Indigo, Woad, Dyers weed, or indeed that most of the Plants whose leaves are usd in dying, and yet those latent qualifications have when discoverd produc'd Coulours without which our dyers could hardly go on with their Trades.[25]

While the economic potential of dyes was obvious, the benefits to be gained from the fauna that was encountered during the voyage were less tangible. Nevertheless, extensive collecting was necessary, for it was impossible to predict when a valuable find would be made. Consequently, the majority of Banks' days aboard the *Endeavour* during the outwards voyage to Tahiti consisted of going out in small boats to collect specimens of fish, birds, invertebrates, and even mammals. These animals were dutifully classified, recorded, preserved, and sketched. As so little was known about the oceanic species, Banks and his companions discovered a great number of new species. Many of the captured animals were eaten, not out of necessity, but from curiosity: perhaps a new delicacy would be found. Sharks were as likely to end up on the dinner table as in specimen bottles. For example, Banks recorded in his journal that the shark he had brought aboard

> proved to be the *Squalus Charcharias*...and assisted us in clearing up much confusion which almost all authors had made about that species. Notwithstanding...we made shift to have a part of him stewd for dinner, and very good meat he was, at least in the opinion of D^{r} Solander and myself, tho some of the Seamen did not seem to be fond of him, probably from some prejudice founded on the species sometimes feeding on human flesh.[26]

Apparently shark fishing would not replace the cod fisheries of the Grand Banks.

Despite such culinary setbacks, Banks was devoted to describing the plants and animals that he encountered. The hopes of discovering new species was never far from his thoughts. He was determined that no obstacle would prevent him from studying new flora and fauna, wherever it might be. That is not to say that difficulties did not arise. When the *Endeavour* sailed into port at Rio de Janeiro in the middle of November 1768, the Viceroy,

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25. Ibid., Vol. I, p. 359.
26. Ibid., Vol. I, p. 168.

Don Antonio Rolim de Moura, gave the British ship a less than warm welcome. Apparently, the Viceroy was under the impression that the *Endeavour* was a trader-spy ship sent by the British government to discover strategic secrets from the region under his control. The result was the crew being denied access to Rio de Janeiro. Banks and Solander, however, managed to smuggle themselves ashore on several occasions under the pretense of purchasing fresh plants for the making of salads. In this way they were able to briefly observe the local flora and fauna. Bemoaning the lack of time available for collecting specimens Banks wrote in his journal that, "The countrey where I saw it abounded with vast variety of Plants and animals, mostly such as have not been describd by our naturalists as so few have had an opportunity of coming here..."[27] Banks was petulantly bitter over the lost opportunity to make new discoveries. Surely there could have been no worse thought to him than the possibility that he had missed the opportunity of a lifetime because of the Viceroy's inability to believe that naturalists, rather than spies, could be a driving force behind an overseas expedition.[28] As a credit to Banks' productivity, though, it should be noted that his Pocket Book contains a record of 245 specimens, over 160 of which were new discoveries, collected during his brief encounter with the flora of the area around Rio de Janeiro.[29] Future botanists benefited from Banks' and Solander's Brazilian observations.

Upon reaching Tahiti, the official destination of the *Endeavour*, Banks quickly recognized several species of plants that he believed could provide substantial contributions

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27. Ibid., Vol. I, p. 191.
28. Ibid., Vol. I, p. 187 (n. 1). Also, see J.C. Beaglehole (ed.),*The Journals of Captain James Cook, Volume I, The Voyage of the Endeavour* (Cambridge, Cambridge University Press, 1955), Vol. 1, pp. cxxxviii-x. While the British adamantly maintained their innocence in this matter, the Viceroy was, in a certain respect, correct in his belief that the *Endeavour* was on a spy mission. He was wrong, however, in his understanding that the British wished to make port at Rio de Janeiro to steal strategic secrets. Rather, Banks and Solander were engaging in a relatively new form of espionage (although it is unlikely that they would have interpreted their actions as such) that would grow in significance in the years to come: the theft of biological species. British interests in commercial biology were about to expand many-fold, in large part due to Banks' influence as the unofficial director of the Royal Gardens at Kew and as President of the Royal Society. During the last fifty years of his life he spared no effort to import commercially important plants and animal species inside the boundaries of the British Empire to benefit British interests directly or to break a monopoly another country held to a particular resource. By modern standards Banks and the plant collectors he dispatched to foreign countries were engaging in what is now called industrial espionage.
29. Beaglehole (ed.) (1962), Vol. II, pp. 289-296.

to the British Empire as sources of food, dyes, or fabrics. The first of these was the breadfruit. As Tahiti so resembled the European's concept of paradise, it is easy to appreciate Banks' praise for the breadfruit, as well as understand why he believed it would be a valuable resource for Britain. "In the article of food," he wrote in his journal, "these happy people may almost be said to be exempt from the curse of our forefathers; scarcely can it be said that they earn their bread with the sweat of their brow when their chiefest substance, Breadfruit, is procur'd with no more trouble than that of climbing a tree and pulling it down."[30] The breadfruit seemed to be an ideal plant to introduce to the British Empire, especially some of the more tropical colonies. For while Banks admitted that the trees did not grow spontaneously, it was his opinion that

> if a man should in the course of his life time plant 10 such trees, which if well done might take the labour of an hour or thereabouts, he would as compleatly fulfill his duty to his own as well as future generations as we natives of less temperate climates can do by toiling in the cold of winter to sew and in the heat of summer to reap the annual produce of our soil, which when once gathered into the barn must be again resowd and re-reapd as often as the Colds of winter or the heats of Summer return to make such labour disagreable.[31]

Banks was also fascinated by Tahitian cloth, all of which was made from plant fibers. Before describing the method by which the cloth was made he commented that "I am not without hopes that my countrey men may receive some advantage either from the things themselves or at least by hints derivd from them."[32] Banks recorded that there were three grades of cloth produced from the fibres of three different trees. The Chinese paper mulberry (*Broussonetia papyrifera*) was used to make a strong brown cloth, and a Tahitian fig tree (*Ficus prolixa*), when properly treated, yielded a white cloth. The breadfruit tree (*Artocarpus altilis*) proved to be valuable for another purpose, as its fibres were used to produce the *ora* cloth, greatly esteemed as a bed-covering and favored for draping the great

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30. Ibid., Vol. I, p. 341.
31. Ibid., Vol. I, p. 341.
32. Ibid., Vol. I, p. 353.

idols. All three of these trees were "cultivated with much care", especially the *Broussonetia papyrifera*, "which covers the largest part of [Tahitian] cultivated land."[33]

Judging from the attention to detail that Banks devoted to his description of how the fibres of the various trees were prepared and woven into the cloth, one must assume that he had considered the cloth to be of potential value. However, while he believed that the cloth "both thick and thin resembles most the finest cottons in softness especially in which article it even exceeds them," he concluded that the cloth's "tenderness (for it tears by the smallest accident) makes it very impossible that it can ever be usd in Europe..."[34] Banks decided that Tahitian cloth was best suited to tropical climates, especially for bedding, far surpassing English materials used for this purpose. If the British Empire were to expand into the South Pacific and establish permanent settlements, the cloth could then prove to be useful.

Once the *Endeavour* reached New Zealand Banks fared better, finding a plant that drove away any thoughts he might have had of transferring the Tahitian fibre producing plants to Britain. While greatly impressed by the flora of New Zealand as a whole, Banks reserved his highest praise for New Zealand flax (*Phormium tenax*), which he referred to as "the most excellent in its kind, and which realy excells most if not all [flaxes] that are put to the Same uses in other Countries...."[35] In New Zealand flax Banks believed that he had found the ultimate fibre producing plant. He determined that there are two types of flax plant: "the leaves of Both much resemble those of flags: the flowers are smaller and grow many more together, in one sort they are Yellowish in the other of a deep red." Despite slight differences in appearance, both were utilized for daily needs by the New Zealanders, prompting Banks to continue to praise the virtues of the flax:

> Of the leaves of these plants with very little preparation all common wearing apparel [used by the New Zealanders] are made and all Strings, lines, and Cordage for every purpose, and that of a strength so much superior to hemp as scarce to bear a comparison with it. From the same leaves also by

33. Ibid., Vol. I, p. 353.
34. Ibid., Vol. I, p. 356.
35. Ibid., Vol. II, p. 10.

> another preparation a kind of snow white fibres are drawn, shining almost as silk and likewise surprizingly strong, of which all their finer cloaths are made...[36]

No such plant in Europe combined the properties of being stronger than hemp and as shiny as silk. This was a unique find and potentially a valuable find. While the textile industry could certainly have made use of New Zealand flax, the Admiralty would prove to be even more interested. Without sufficient supplies of hemp the Royal Navy was effectively rendered inoperable. The discovery of a new material that could be used to make cables stronger than any currently in use would be of particular value, especially on the largest of the Navy's warships. With this in mind Banks' comment that "So usefull a plant would doub[t]less be a great acquisition to England," seems somewhat anticlimactic. Regardless, Banks was positive that New Zealand flax could be transplanted to Britain, for "it seems hardy and affects no particular soil, being found equaly on hills and in Valleys, in dry soil and the deepest bogs, which last land it seems however rather to prefer as I have always seen it in such places of a larger size than any where else."[37]

Time would demonstrate that Banks' impression of New Zealand flax was well founded. Upon his return to Britain visitors to his house, such as the Reverend William Sheffield, often remarked upon the specimens of cloth woven from the New Zealand plant. Sheffield could not resist writing Gilbert White, the noted natural historian, to tell him of this material. The fibre with which the material was woven, wrote Sheffield, was "something resembling our hemp, but of a finer harl and much stronger, and when wrought into garments is as soft as silk: if the seeds of this plant thrive with us, as probably they will, this will perhaps be the most useful discovery they made in the whole voyage."[38]

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36. Ibid., Vol. II, p. 10.
37. Ibid., Vol. II, pp. 10-11.
38. Lysaght, p. 254. Plans to cultivate New Zealand flax contributed to the settlement of New South Wales in 1788. See G.C. Bolton, "The hollow conqueror: Flax and the foundation of Australia," *Australian Economic History Review*, 8 (1968), pp. 3-16.

As mentioned, Banks was tremendously impressed with the flora of New Zealand. In particular, he was amazed by the size of the trees. This he attributed to the richness of the soil. Hence,

> the timber trees which were the streightest, cleanest, and I may say the largest I have ever seen - at least speaking of them in the Gross; I may have seen several times single trees larger than any I Observd among them, but it was not one but all these trees which were enormous, and doubtless had we had time and opportunity to search, we might have found much larger ones than any we saw...[39]

Banks was quite cognizant of the value of timber. Being a subject in an Empire that was dependent upon its shipping and its naval defense one would be surprised if he was not aware of the vital need for supplies of wood. However, he was able to recognize other uses for the New Zealand timber as well. On one occasion Banks drew attention to a particular tree, "one which bears a very conspicuous scarlet flower made up [of?] many threads, and is a large tree as big as an oak in England, has a very heavy hard wood which seems well adapted for the Cogs of Mill wheels &c. or any purpose for which very hard wood is us'd."[40] Banks' suggestion of using the wood for milling draws attention to one of his more valuable assets as an observer of biological species for practical use: the fact that he spent a large portion of his youth on his family's Lincolnshire estates. Because of this, his formal education was not as exacting as many of his peers (something which did cause him difficulty at Eton and Oxford, and can be seen in his improper knowledge of the Classics). However, Banks was very familiar with the workings of an agricultural district, his family having taken an active role in the farming, husbandry, and draining of the fens surrounding their estates.[41] This agricultural familiarity made Banks ideally suited for his role aboard the *Endeavour*. His unorthodox background and education provided him with a greater breadth of knowledge concerning practical applications for such species as the

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39. Beaglehole (ed.) (1962), Vol. II, p. 3.
40. Ibid., Vol. II, pp. 9-10.
41. Banks continued this tradition. Even after he suffered greatly from gout he insisted upon returning to his Lincolnshire estates to actively participate in harvest festivals and the like. See, for example, the account of Bank's activities during the summer of 1795 in H.B. Carter, Sir *Joseph Banks and the Plant Collection from Kew Sent to the Empress Catherine II of Russia, 1795*, (London, Bulletin of the British Museum (Natural History) Historical Series Vol. 4, No. 5, 1974), pp. 309-311.

New Zealand trees. His generalist background allowed him to spot connections that others, more formally trained, might have overlooked.

This is not to say that Banks was incapable of seeing the more obvious uses for his discoveries: he was very much aware of Britain's need for timber for its shipping interests. Consequently, he noted that the Pohutukawa tree (*Metrosideros tomentosa*), once plentiful along the coasts of New Zealand, "is tall streight and thick enough to make Masts for vessels of any size, and seems likewise by the streight direction of the fibres to be tough but is too heavy..." However, all was not lost, for Banks added that, "I have been told this is the case with the pitch pine in North America, the timber of which this very much resembles, and that the North Americans know how to lighten by tapping it properly and actualy use it for Masts."[42]

The trees and other plants of Australia were subjected to similar consideration by Banks. Banks and his associates collected, described, and preserved samples of the flora, often speculating on possible uses for their finds. For instance, Banks wrote that there was "no want of trees of more than the midling size and some in the valleys very large," along the coast of Australia. However, he concluded they were not as useful as the New Zealand species for all were of "a very hard nature; our carpenters who cut them down for firewood complaind much that their tools were damagd by them."[43] Other Australian trees Banks deemed to be valuable, though. Probably referring to *Melaleuca leucadendron* (the Queensland Tea-tree), which has a soft layer of thin brownish inner bark under the outer skin, Banks wrote that "Some trees there were also to the Northward whose soft bark, which easily peels off, is in the East Indies applyd to the use of calking ships in Lieu of

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42. Beaglehole (ed.) (1962), Vol. II, p. 10. New South Wales did develop a thriving ship building practice. See, for example, D.R. Hainsworth, "The New South Wales shipping interest 1800-1821: A study in colonial entrepreneurship," *Australian Economic History Review*, 8 (1969), pp. 17-30 and B. Little, "The sealing and whaling industry in Australia before 1850," *Australian Economic History Review*, 9 (1969), pp. 109-127.
43. Beaglehole (ed.) (1962), Vol. II, p. 114.

Oakum."[44] While this was not a new discovery, as the tree also grew in the East Indies, it was always valuable to find new supplies of recognized resources.

Certain other Australian plants Banks considered to be valuable as foodstuffs, not only for people, but for animals. For example, a "Cabbage...was small but exquisitely sweet and the nuts which it bore in great abundance a very good food for hogs."[45] Numerous other plants were sampled and deemed to be edible. Banks noted a type of Palm cabbage, referred to in the West Indies as "Indian Kale", a kind of bean, which he found edible but distasteful, a parsley, and a spinach. In addition there were a variety of fruits, including one resembling a "heart cherry", a kind of fig that grew from the stalk of a tree (which Banks noted only as being "very indifferent"), a fruit the sailors named plums because of their color (although they were "flat like a little cheese"), and a damson. After describing these plants Banks added that "I believe some of them were never eat by Europeans before."[46] Judging from his harsh comments concerning the taste of some of these fruits and vegetables one must wonder how honoured he felt at being one of the first to partake of them. Distasteful or not, and crude as this form of testing may seem, eating newly discovered plants or animals was a necessary and valuable means of determining if a species was worth transplanting to other parts of the British Empire as a food source. However, recognizing the limitations of the expedition, Banks was forced to conclude his journal entry on Australian plants by writing, "Many of these have no doubt properties which might be usefull, but for Physical and economical purposes which we were not able to investigate..."[47] Future expeditions would have to build on the groundwork laid by Banks and his companions.

Although Banks never returned to Australia or the islands of Pacifica, he did not forget the diversity of the plants he discovered, many of which he believed had the potential for commercial development. During his unofficial directorship of the Royal Gardens and

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44. Ibid., Vol. II, p. 114.
45. Ibid., Vol. II, p. 115.
46. Ibid., Vol. II, p. 114.
47. Ibid., Vol. II, p. 116.

his Presidency of the Royal Society, the idea of making better use of natural resources to benefit the British Empire commercially remained clearly in evidence. The Royal Gardens became a clearing house for all manner of seeds and plants sent there not only by private citizens, but also by agents specially commissioned and dispatched by Banks expressly for the purpose of discovering new species of plants. Those plants that proved useful were then sent off to British colonies to enrich the plantations and aid not only the growth of the colonies, but to strengthen the British Empire as a whole.

Banks, the Royal Society, and British Interest in Natural History

At the centre of British science was the prestigious Royal Society. The Society was still relatively young, having only celebrated its centennial six years before Banks was made a Fellow in 1766. Granted its charter under Charles II, the Royal Society's statutes proclaimed that its purpose should be to,

> ...order, take account, consider, and discourse of philosphical experiments and observations; to read, hear, and discourse upon letters, reports, and other papers concerning philosphical matters; as also to view, and discourse upon, rareties of nature and art; and thereupon to consider, what may be deduced from them, or any of them; and how far they or any of them, may be improved for use or discovery.[48]

From the Society's first meetings experiments were performed for the review of the Fellows. Demonstrations of scientific experiments were considered to be the ideal means of disseminating knowledge and advancing not only the sciences, but learning as a whole (although, following Newton's Presidency (1703-1727), the Royal Society saw a marked increase in the reading of scientific papers and letters as opposed to demonstrating experiments at meetings).[49] Regardless of whether experiments were conducted or papers read, the principle that the Society should exist to allow a haven for scholarly discourse, untroubled by political, religious, or social convictions, remained in force. In this manner,

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48. 1663 Statute of the Royal Society, cited in M.B. Hall, *Promoting Experimental Learning: Experiment and the Royal Society, 1660-1727* (Cambridge, Cambridge University Press, 1991), p. 1.
49. M.B. Hall, *All Scientists Now: The Royal Society in the Nineteenth Century* (Cambridge, Cambridge University Press, 1984), pp. 3-5.

the Society served to help elevate the study of science above the common concerns of the world.

During his Presidency Banks upheld this ideal through his habit of demonstrating a fine disregard for political issues. He corresponded openly with Benjamin Franklin, Jean Nicolas Sebastien Allmand (a Dutch botanist), and John Baptiste Joseph Delambre (a French astronomer), to name but three, during periods when Britain was at war with these scientists' respective nations. This was to become a particularly important trait in Banks' career for he instilled the Presidency with a sense of national neutrality which often allowed him to intervene successfully in situations in which the British government could not due to reasons of political necessity. In this way, Banks' direct intervention managed to secure the release of a number of prisoners of war, both British and foreign, during several periods of hostility. Between January 1804 and March 1805, for example, Banks maintained communications with Jean Baptiste Joseph Delambre of the French *Institut National* concerning the fate of numerous prisoners. Speaking on behalf of the Royal Society, Banks' requests were considered seriously by the French and acted upon. John Osborn, Edward Pigot, James Forbes, and Robert Ferguson gained release, at least in part, through the auspices of the *Institut National.*[50] The *Institut* also "unanimously recommended" an approach be made to the French Minister of Marine on behalf of Captain Flinders, who had been captured by the French during his voyage of discovery in 1801.[51] In return, Banks assured French scientists that he would continue to do everything in his power to likewise aid French savants that were detained in Britain.[52]

There is some indication that these activities caused Banks difficulty with certain members of the British government late in 1806. Lord Horwick, the First Lord of the Admiralty, took issue with Banks' requests for the release of several French prisoners. Previously, Banks had intervened successfully on behalf of Captains Milius and Rivaud,

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50. *TBL*, p. 256.
51. Ibid., p. 257.
52. Ibid., pp. 256.

two French prisoners of war. In return for this service, Banks contacted the French Senator, Lacepede, and requested the liberation of Captain Flinders, Egerton, and also Mr. Gee (the son of a personal Bostonian friend). As this would have been the release of three men for two, Banks was requested to secure the freedom of Julien Jouneau of the frigate *Didon*.[53] At this point (August 1806) Howick protested, stating that the prisoners had not gained their release through Banks' auspices and that he could no longer consent to Banks' requests for the release of French prisoners until the French Government adopted a more liberal attitude towards the release of British prisoners.[54] In a scathing reply, Banks accused Howick of being fearful that his intervention could interfere with Howick's personal efforts to secure the liberation of Royal Navy officers. Banks added that it was his belief that the actual cause of Horwick's displeasure was that Banks should share the credit for Milius' release.[55] Motivation aside, Banks' letters had the desired effect and Howick backed down, stating that the whole incident had merely been a simple misunderstanding and that he could, of course, have no objection to Banks using his influence to secure the liberation of British prisoners of war.[56]

In a related matter, Banks often used his not inconsiderable influence to see that scientific cargoes, captured as prizes during war, would be returned to their rightful owners. In one such incident Banks discussed the release of Jacques-Julien de La Billardière's (a French botanist, 1775-1834) natural history collection with the British Government. After the collection was duly returned to the botanist, Banks indicated to de La Billardière that the whole process would probably have been significantly faster if an application for its return had been made directly by the *Institut National* to Banks or the Royal Society rather than by Louis XVIII or the government of the Repulic, which resulted in making the collection an item of political importance. "That the science of two Nations

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53. Ibid., p. 580 (7 Aug. 1806).
54. Ibid., pp. 580-581 (8 Aug. 1806).
55. Ibid., p. 374 (28 Sept. 1806). Also see *TBL*, p. 581 (9 Aug. 1806).
56. Ibid., p 374 (2 Oct. 1806).

may be at Peace while their Politics are at war," wrote Banks to de La Billardière, "is an axiom we have learned from your Protection of Capt. Cook."[57]

Regarding the status of science in Britain, as opposed to Banks' involvement with British science, the eighteenth century saw the study of the life sciences, especially botany, increase in popularity. The Royal Society was affected by this popularization of the natural sciences. There was, however, some opposition to such a course of action. Following the end of Newton's Presidency of the Royal Society, many Fellows were disgruntled with the move away from mathematics and the physical sciences.[58] Recently, David P. Miller suggested that the interests of the Royal Society were mirroring those of Britain as a whole during the early eighteenth century, keeping in tune with the coffee-house culture: a shift in interest away from esoteric mathematical natural philosophy to natural history, easier for the non-academic (i.e., common man) to grasp and appreciate.[59] Miller's point is well taken. A simple stroll down any country lane in Britain, in which one observed the plant and animal life, provided ample material for discussion with friends. No longer did a person have to be a member of the Royal Society to feel involved in the study of science.[60]

Concurrent with a shifting in the focus of the Royal Society, mid-eighteenth century Britain began to see an increase in the writing of books devoted solely to the study of the natural sciences. Some of these works from early in the century, such as Hales' *Vegetable Staticks*, were similar to studies in the physical sciences in that they involved research carried out in a laboratory.[61] The research described in *Vegetable Staticks*, for example,

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57. Ibid., p. 78.
58. In the mid 1780s Banks encountered difficulty from mathematicians in the Royal Society who claimed he was stacking the Society with natural historians. See O'Brian for an account of the situation (pp. 208-211).
59. D.P. Miller, "'Into the valley of darkness': Reflections on the Royal Society in the eighteenth century," *History of Science*, 27 (1989), p. 157.
60. Although, of course, there were still many who wished the prestige of adding the much coveted F.R.S. to their name. The admittance of wealthy, non-scientifically minded men to the Royal Society was an event that Banks took issue with during his term as President. Banks attempted to reduce the ratio of non-scientific Fellows to Fellows actively engaging in scientific research, although he had far less success in this regard than he had hoped. Of course, he could not have eliminated all non-scientists from the ranks of the Royal Society for it was largely the patronage of these Fellows that served to keep the Royal Society in the luxury to which it was accustomed.
61. S. Hales, *Vegetable Staticks* (London, W. & J. Innys and T. Woodward, 1727).

was designed to demonstrate a similarity between the flow of sap in plants and the circulation of blood in animals. While Hale chose to adopt the rigid laboratory conditions of the physical sciences, most natural historians opted for a descriptive, classificatory approach to investigate the largely unknown diversity of biological species. One such example of this style of natural history was seen in J.P. de Tournefort's botanical work, translated into English by T. Martyn between 1719-1730 as a two volume set entitled *The Complete Herbal.*[62] By mid-century John Hill had published several books along similar lines, but relating more specifically to British knowledge.[63] Equipped with such books anyone could now identify and learn the known properties of plants native to Europe. Furthermore, Linnaeus' taxonomic classification system allowed for greater accuracy in identification of plants throughout the world. And while Linnaeus' work was intended for serious students of the biological sciences, it was not long before summaries of his system were available, allowing the layman access to the powerful taxonomic tool.[64]

While botany was a particularly popular subject of study, because the keeping of gardens is easier than the maintenance of menageries, books on the study of animals were not neglected during the eighteenth century. Eleazar Albin, for example, wrote a text on ornithology.[65] For those interested in smaller forms of animal life there was another book by Albin, *A Natural History of English Insects.*[66] Another English natural historian, Moses Harris, wrote *The Aurelian* which marked the formal development of entomological studies as a popular hobby in England. Published in series in 1766, each issue of *The Aurelian* included a gorgeous hand-colored plate along with illustrated descriptions of

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62. J.P. de Tournefort, The *Complete Herbal*, T. Martyn (trans.), 2 Volumes (London, R. Bonwicke & J. Morphew, 1719).
63. J. Hill, *A General Natural History* (London, T. Osborne, 1748) and J. Hill, *The Construction of Timber: From Its Earliest Growth: Explained by the Microscope, and Proved in Experiments...* (London, John Hill, 1770).
64. See, for example, J. Lee, *An Introduction to Botany*, (Edinburgh, 1760). Lee, a nurseryman, summarized Linnaeus' work rather than translating it, for he believed it to be "interspersed with philosophical and critical Remarks that are of less general Use".
65. E. Albin, *A Natural History of Birds* (London, E. Albin, William Innys, John Clarke, & John Brindley, 1731).
66. E. Albin, *A Natural History of English Insects* (London, E. Albin, 1720).

butterflies and moths.[67] George Stubbs also rendered natural history in an artistic form: his beautifully illustrated *Anatomy of the Horse* harkened back to the Renaissance tradition of combining art with science.[68] This work, for which Stubbs not only carried out the necessary research but also drew the illustrations is still valued today by veterinarians for the exacting quality of the diagrams.

The effect of these books devoted to the study of natural history was to make the understanding and appreciation of biology more available to the layperson. It was books of this nature with which Banks would have been familiar.[69] Indeed, Banks was in the position to be even more affected by these works as he was personally acquainted with a number of the authors, such as Thomas Pennant, who wrote his famous *British Zoology* in 1768, and Gilbert White, who would come to write the well known *Natural History of Selborne* in 1789.[70] Thus, Banks was in the unique position to learn directly from the masters in the field of natural history. Furthermore, because science was moving away from a strict adherence to mathematics, physics, and chemistry, and broadening its scope of horizon towards the study of the biological sciences, Banks had the opportunity to capitalize upon the knowledge he received from both published works and respected natural historians. Therefore, while Banks had no control over the scientific trends of the 1760s, his timing was perfect: the scene was set for further and more far-ranging studies in natural history and Britain was receptive to proposals involving commercial biology.

George III and Kew

The *Endeavour* voyage provided Banks with two things of importance: practical experience and public recognition. As is so often the case, while the former was of greater

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67. Cited in T.R.E. Southwood, "Entomology and mankind," *American Scientist*, 65 (1977), p. 31.
68. G. Stubbs, *The Anatomy of the Horse* (New York, Dover Publications, 1976 (first edition 1766)). Interestingly enough, Stubbs performed most of the work necessary for his book in Lincolnshire, the county in which Banks' family estates were located.
69. Lysaght, p. 46, notes that prior to Banks' expedition to Newfoundland and Labrador his library included books by Linnaeus, Edwards, and Catesby.
70. T. Pennant, *British Zoology* (London, B. White, 1768) and G. White, *The Natural History of Selborne* (London, Henry G. Bohn, 1851).

value for his future endeavours, it was the latter that gained him access to the resources that he would come to need. The first of these was the Royal Gardens at Kew.

Cook, Banks, and Solander returned to Britain as heroes. They were the toast of London, avidly sought out to attend a variety of social gatherings. At one such, less than a month after their return, Sir John Pringle, President of the Royal Society, presented Banks and Solander to King George III. This first meeting at court was followed by a second at Richmond where the two naturalists spent time recounting their voyage to the monarch. Banks soon had a third meeting with the King and his family to display a selection of the most prized and curious items collected during the voyage. The result of these meetings was a very real and lasting friendship between Banks and George III. Part of the reason for this friendship was Banks' non-partisan attitude towards politics. He had openly declared that he would never become involved in political maneuvering. One must surmise that this was particularly refreshing to George, surrounded as he was by the fractious affairs of state. Even more important, though, was the fact that the two men were of a like age and shared an interest in horticulture and plants, particularly, noted C. Lyte, "those plants which could benefit society as food or as raw material for manufacturing."[71]

George III's interest in natural history came from his mother who spent much of her time at Kew Gardens, and his tutor, John Stuart, 3rd Earl of Bute, a skilled horticulturalist who also maintained respectable gardens at Mount Stuart on the Isle of Bute, at Luton Hoo (in Bedfordshire), and on his property at Christchurch in Hampshire.[72] The Royal Family had taken a particular interest in the Royal Gardens at Kew for some time prior to this. The Gardens were founded by Sir Henry Capel shortly after the Restoration, but came under royal control in 1730 when Fredrick, Prince of Wales, took a lease on Kew House from the Capel family. In the early 1750s, Augusta, Dowager Princess of Wales, assisted by Lord Bute, began developing the Gardens more fully.

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71. Lyte, p. 45.
72. For a review of Bute's contribution to the study of natural history see D.P. Miller, "'My favourite studdys': Lord Bute as a naturalist," in K.W. Schweizer (ed.), *Lord Bute: Essays in Re-interpretation* (Great Britain, Leicester University Press, 1988), pp. 213-239.

Following Bute's withdrawal from public life in 1772 there was no director of the Gardens which had flourished to the point where it surpassed Banks' much loved Chelsea Physic Garden in size and popularity. Without proper guidance, the Royal Gardens at Kew would have rapidly degenerated.

Aware of modern trends in natural history, George III wanted Kew developed along scientific lines.[73] Recognizing a like minded man in Banks, George appointed him the special adviser and director of the Gardens in 1772. The everyday running of the place was left to the Royal Gardener, William Aiton, while the long range planning and overall scheme of the Gardens fell under Banks' jurisdiction. Banks' personal resources were substantial, but they could in no way compare to those now made available to him through the Royal Gardens. Banks could now take the knowledge gained during his three-year voyage around the world and make practical application of it. In Kew he could produce an international clearing house for plants and seeds. The end result was an addition of more than 7,000 new exotic plants being brought into cultivation in England during the reign of George III (primarily during Banks' directorship of the Gardens, 1772-1820).

Conclusion

This chapter demonstrates several key points important to the understanding of Banks' later life. By the time he had returned to Britain from the *Endeavour's* three-year voyage his character and thoughts on the importance of natural history had been essentially set. Banks was equipped with an education in natural history gained from the new generation of scientific books that had captured British academic attention, knowledge passed on to him by recognized experts in the field, as well as almost four years of practical, real-world experience in collecting and identifying flora and fauna from across the globe. He was ready to begin applying what he had learned. Most significantly, Banks

73. J.N. Hepper, *Kew: Gardens for Science & Pleasure* (London, Her Majesty's Stationery Office, 1982), p. 1 and E. Smith, p. 94.

had discovered that the British Empire could benefit greatly through ventures in commercial biology. All that he lacked was the means to bring his ideas and concepts to fruition. This difficulty was largely overcome through the intervention of George III when, after he met Banks and discovered a number of shared interests, he made Banks the unofficial director of the Royal Gardens at Kew. Once in this position Banks had the necessary resources to apply his ideas on commercial biology to British imperial expansion.

If his expedition of 1766 to Labrador and Newfoundland and the *Endeavour* voyage had taught Banks anything, it was that there existed a seemingly infinite diversity of plant and animal life in largely unknown regions of the world. Being a patriotic member of the landed gentry whose family's wealth had been largely derived from agriculture and mercantilism, it was natural that Banks would see how commercially valuable many of these plants and animals could be to Britain. And while Banks was adamant that scientific knowledge should know no national boundaries, there was no reason that other European countries should benefit at the expense of the British Empire.[74] His time in Labrador and Newfoundland, for example, had shown him the commercial importance of the fisheries. The fact that he saw the French making more productive use of these fisheries reinforced the lesson that when resources are finite they will always be competed for.

Of course, much of what Banks accomplished with regards to improving commercial biology for the British Empire could never have occurred if the social and political conditions had not been right. The fact that natural history had become increasingly popular during the course of the eighteenth century, so much so that the study of gardening and horticulture was one of George III's favorite pastimes, allowed a man of Banks' background and interests to rise to hold the Presidency of the Royal Society. Prior to Banks' election to the Presidency in 1778, the Royal Society had been floundering without real guidance or focus. While Banks was a competent natural historian, he proved to be a superior administrator. Capitalizing on the prestige of the Royal Society, as well as

74. Refer, also, to note 31 in the Introduction for additional discussion about Banks' contradictory views on the neutrality of science and certain actions he took in the name of imperial expansion.

his connections with powerful and influential friends in Britain and abroad, Banks made himself an indispensable advisor to the British Government. In this manner he was able to carry out his goals of utilizing commercial biology to further the British Empire.

Breadfruit, Merinos, and Hemp: Three Case Studies in Applications of Commercial Biology

Introduction

This chapter will examine Banks' significance to the British Empire with respect to commercially important plants and animals after he returned from the *Endeavour* voyage. The most famous projects in which Banks was involved were the Breadfruit Expeditions and the acquisition of the merino sheep from the Spanish royal flock. Both have been the subject of considerable writing in the past. However, there has been little attempt to examine Banks' activities in the context of the expansion and development of the British Empire as a whole in each of these ventures, the principal exception being the work of D. Mackay who has examined Banks' involvement with the breadfruit.[1] The third component of the chapter will examine Banks' involvement in the less renowned, though equally significant, attempt to grow hemp on British soil for naval stores. It should be noted that Banks was associated with numerous other activities focusing on the use of commercial biology to forward British interests. Examples include the otter pelt trade from the west coast of North America to China, his interest in growing rice in England, and attempts to cultivate tea in British India. Banks' involvement with the breadfruit, merino sheep, and hemp have been specifically chosen for investigation in this chapter because they clearly demonstrate not only his pivotal role in British imperial expansionism during the late eighteenth and early nineteenth centuries, but the increasing interest paid to commercial biology by the British government.

Banks and Commercial Biology

One of the most significant aspects of Banks' career was his devotion to the promotion of economically significant plant and animal species within the boundaries of the British Empire. In the late twentieth century the importance that biological products held in the past has been generally forgotten. As recently as the middle of this century, for example, more than half of all medicines were derived from plants; synthetic manufacturing

1. Mackay (1974), pp. 61-77.

of pharmaceuticals is a recent event. An example highlighting the importance of plant species to the eighteenth-century nations can be seen in naval stores. Hulls, masts, caulking agents, tar, ropes, and sails were all derived from plants. Without a sufficient supply of these items the British Empire could never have maintained its naval interests. For obvious reasons a great deal of emphasis was placed upon the discovery and development of new and untapped natural resources that could be applied to British shipping.

By the time Banks became President of the Royal Society he was deeply engaged in the movement of commercially valuable plant and animal species between regions of the British Empire. If Britain lacked access to an important species Banks sought to move it to within the boundaries of the Empire. This aspect of Banks' actions as an agent of British ecological imperial development had seen its origins well before his election as President of the Society. One can suppose that Banks had some glimmerings of the economic significance of plant species from an early age when he learned from the old women around Eton the medicinal significance of the local flora. The thought of finding beneficial objects of natural history was a common hope on voyages of discovery during the mid to late eighteenth century. Banks and his circle of natural historian friends who met at the *Horace's Head* reflected on this aspect of overseas expedition more than once. Soon after the *Endeavour* sailed Gilbert White wrote to Thomas Pennant, wondering if Banks' participation on the voyage would result in the "discovery of something highly beneficial to mankind?"[2]

The Breadfruit Expeditions

Before Banks had completed his first decade as President of the Royal Society he became involved in one of his most famous projects following his return to Britain in

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2. Lysaght, p. 250.

1771.[3] This was the Breadfruit Expeditions which gained renown due, in part, to the infamous "mutiny on the *Bounty*" which prematurely terminated the first of the two attempts to transplant breadfruit from Tahiti to the British West Indies. A second attempt resulted in the successful transplantation of about 1,000 breadfruit trees. The Breadfruit Expeditions owed much of their eventual success to Banks' patronage. Had Banks not been as influential with the King and government as he was it is likely that these Expeditions would not have been initiated, at least, not as early as they were. Despite the fact that the first of the Expeditions ended in disaster and the immediate goals of the venture fell short of expectations, over the long term the project to transplant breadfruit to the West Indies succeeded in strengthening the Empire. Thus, Banks' involvement in the Breadfruit Expeditions was in keeping with his vision of British imperial expansion.

The events which led to the organization of the first Breadfruit Expedition (1787) had their origins in the 1760s. Historically, the West Indies was economically dependent upon the production of the sugar crop.[4] The Seven Years War had demonstrated the economic hazards of reliance upon a single crop in the British West Indies to both the local plantation owners and the British government. In an attempt to forestall future difficulties, in 1760 the Society of Arts offered a reward to anyone who could successfully cultivate a crop of cinnamon in the West Indies. The following decades saw similar rewards offered for other commercial crops such as cochineal, silk, indigo, fine cotton, cloves, camphor, and coffee.[5] Reliance upon only the sugar crop, the single most important agricultural

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3. There were, in fact, a number of other highly significant, although less well known, events that Banks was involved in during 1787-1788. For example, the Linnaen Society, devoted to the study of botany, was founded in 1788. While Banks was never a Member, he was an active patron of the Linnean Society and close friend of James Edward Smith, first president of the Linnaeus Society, and the man who purchased Linnaeus' library after the Swedish biologist's death. Similarly, Banks was involved in the 1787 organization of the Calcutta Botanic Gardens, founded and overseen by Lieutenant Colonel Robert Kyd. Banks and Kyd had corresponded for some time prior to the Garden's formal establishment and Banks' help and guidance are readily apparent from the correspondence between the two men.
4. For an account of the development of the British West Indies' dependency upon the sugar crop see R.S. Dunn, Sugar *and Slaves* (Chapel Hill, University of North Carolina Press, 1972).
5. L.J. Ragatz, *The Fall of the Planter Class in the British Caribbean, 1763-1833* (New York, Octagon, 1928), p. 72.

product of the region up until this point, placed the colonies at risk. Diversification was necessary if the colonies of the British West Indies were to remain viable.

The discoveries made during the *Endeavour* voyage were of critical importance because they reinforced the knowledge of the diversity of plants and animals around the world. Following the return of the ship to Britain it became apparent that not all places were equally gifted with beneficial species. In and of itself, the realization of biological diversity was not a new concept. However, with the return of Banks in 1771, his preserved specimens of plants and animals, and sketches and paintings faithfully reproducing the overseas wonders, the benefits of species transplantation were more readily appreciable. Banks' graphic displays of the wondrous tropical plants initiated serious discussion concerning the utilization of these overseas resources.

As a member of the Society of Arts since 1761, Banks would have been well aware of the difficulties that had faced the British West Indies with regards to the colonies' dependence upon the quintessential sugar crop. Conversely, planters in the West Indies were soon made aware of Banks' discoveries in the South Pacific. Of primary interest was the breadfruit. Word of Banks' glowing praise of the tropical plant had spread rapidly. As early as 1772 Valentine Morris, Captain General of the West Indies, wrote to Banks urging that breadfruit be introduced to the British Caribbean.[6] Morris reasoned that the breadfruit, the "chiefest substance" of the Tahitians' diet, according to Banks, would make an ideal food for the slave population of the West Indies, for "Breadfruit is procur'd with no more trouble than that of climbing a tree and pulling it down."[7] Within four years of Morris' request to Banks for help in drafting a plan to transfer breadfruit to the British colonies, both the Society of Arts and the West India Merchants offered separate prizes to anyone who could successfully manage the feat.

The competition was, however, slow to be joined. The initiation of the war in British North America and the arrival of a French fleet in the Caribbean temporarily halted

6. Cited in Mackay (1974), p. 64.
7. Beaglehole (ed.) (1962), Vol. I, p. 341.

any thoughts of transplanting the valued breadfruit tree across a distance of half the globe. This is not to imply that the West Indies had been forgotten or ignored by Banks. Demonstrating, as ever, a fine disregard for international hostilities, Banks maintained his regular correspondence with natural historians in the British West Indies despite the American War. Mathew Wallen, for instance, continued to exchange seeds and plants with Banks during the American War. In one letter Wallen thanked Banks for the seeds that he had sent to Jamaica, adding that they would be of great benefit to the island.[8] In addition, Wallen noted that he had numerous plants ready for an employee of Banks, Roger Shakespear, and indicated that he would endeavour to gain passage to the Bay of Honduras for Shakespear.

While the conclusion of the American War eliminated the potential of military attack on the British West Indies, it also cost the Caribbean colonies a certain amount of business with their primary trading partner. Fresh suppliers of vital resources would be necessary if the British Caribbean was to remain viable. Shipping goods from Britain to the West Indies was costly and slow. Foodstuffs were particularly difficult to transport because of both their bulk and the spoilage suffered during the voyage. Local production of valued resources coupled with supplies from Britain could help to offset the loss of the Thirteen Colonies as principle trading partners.

The British West Indies' major source of commercial revenue was still derived from the sugar crop. Sugar cane plantations were labour intensive, requiring large slave populations to be economically viable. Slaves, unlike hired labourers, had to be fed by the plantation owner. Some plantation owners, remembering the promises made in the early 1770s concerning the value of breadfruit, concluded that the transplantation of breadfruit to the Caribbean could solve the problem of feeding their slave population. Hinton East, a Jamaican planter, believed the stories of the value of breadfruit and wrote to Banks in 1784:

> The acquisition of the best kind of the Breadfruit wou'd be of infinite Importance to the West India Islands in affording exclusive of variety, a

8. *TBL*, p. 850.

> wholesome and pleasant Food to our negroes, which wd. have this great Advantage over the Plantain Trees from whence our Slaves derive a great part of their Subsistence, that the former wou'd be rais'd with infinitely less labour and not be subject to be destroy'd by every smart Gale of Wind as the latter are.[9]

As mentioned earlier, Banks had remained in close correspondence with various plantation owners and natural historians in the British Caribbean during the American War. He was well known by the planters who believed him to be a champion of their cause. This opinion of Banks is readily apparent in letters of the time, such as one written by Mathew Wallen to Hinton East in 1785. Wallen professed to East that "In your application for things useful to this Island, S^{r} Joseph Banks, whose knowledge, Philanthropy, Patriotism & Influence are superior to all others, will be your best assistant."[10] As will be shown, this was an accurate summation of Banks' abilities, for each of Wallen's descriptors of Banks would be involved in the Breadfruit Expeditions.

While Wallen was referring specifically to the help and advice Banks had already provided to the British West Indies, his description of Banks was one that could be applied to many of the ventures in which the President of the Royal Society became involved. There is no question that Banks was a knowledgeable man, though his formal education could certainly not be considered exemplary. The library in his house at Soho Square was regarded with immense respect by natural historians, horticulturists, explorers, and antiquarians throughout Europe and North America. Similarly, Banks was widely recognized as a philanthropist, although it must be added that this trait was in no way unique to Banks. In the realm of commercial biology, however, Banks was perhaps one of the few people fully cognizant of the vast potential that the world's flora and fauna could play in benefiting humanity. Furthermore, Wallen's assertion of Banks' influence was quite accurate. Banks moved in powerful circles. His acquaintance with many of the most significant members of the British government, military, and overseas mercantile establishments, not to mention his close personal friendship with George III, provided

9. Cited in Mackay (1974), p. 63.
10. *TBL*, pp. 850-851 (1785).

Banks with a multitude of resources. Finally, though this was one of his least apparent attributes, as Wallen noted, Banks was tremendously patriotic. This devotion to Britain influenced many of Banks' plans and goals. While ignorant (or apathetic) of most political issues within Britain and abroad he was motivated by a desire to see Britain prosper and wished British ideals to spread across the world.[11] The Breadfruit Expeditions demonstrate clearly how all of these facets of Banks' character could come together and make him a significant factor in British imperialism.

Between 1784 and 1787 Banks was in communication with British subjects in the West Indies.[12] Many of the letters dealt with the establishment of two botanical gardens in Jamaica. Around the same time the garden on St. Vincent, recently captured from the French, was restored. While Banks' involvement with overseas gardens will be discussed more fully in a later section, suffice it to say that with the foundation of the gardens it was now practical to begin serious discussion of the transplantation of a variety of commercially valuable plants, including the breadfruit tree.

There was another reason for the resurrected interest in transplanting breadfruit to the British West Indies: national rivalry. By 1780 the French had already successfully transported a variety of tropical plants to Mauritius and then to the French West Indies. In 1784 Wallen wrote to Banks describing an incident in which the crew of a French ship, realizing escape from a British ship was impossible, destroyed a cargo of valuable plants, including breadfruit, to prevent their capture.[13] Three years later Sir George Younge, Secretary at War, informed Banks that he had received word from St. Vincent that the breadfruit tree was now present in the French West Indies, stating that by this action the

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11. G. Williams, "Captain Cook and the aborigines" (Department of History Seminar, University of Alberta, 10 January 1992). Williams offers an interesting example of Banks' preference for British ideals in his comparison of Cook's and Banks' impressions of the Australian aborigines encountered during the *Endeavour* voyage. Citing diary entries, Williams argues that Cook was far less critical of the aborigines' lifestyle than Banks, who made disparaging comments about their lack of civilization. Cook's consideration that the Australian aborigines lived a better life than Europeans (e.g., the aborigines' lack of interest in material goods) was suppressed in his published diaries.
12. *TBL*, p. 154 (17 June 1787), p. 289 (19 July 1784), p. 289 (19 Aug. 1786), p. 787 (20 June 1786), pp. 850-851 (1785), p. 884 (29 June 1786), and p. 885 (11 Oct. 1786).
13. Cited in Mackay (1974), p. 67.

French had forestalled the British government, which was still deliberating on the matter.[14] Younge was not alone in recognizing the progress made by the French. More requests reached Banks from British Caribbean planters desperate for seeds of East India plants likely to thrive in the Caribbean. Joshua Steele, founder and president of the Society of Arts of Barbados asked Banks for living specimens of cinnamon, camphor, cloves, nutmeg, and pepper. In return he offered Banks samples of aloe plants with remarks on a method of preparing the juice commercially.[15]

Perhaps it was this aspect of national rivalry that finally caused the British government to agree to the formulation of a plan to transplant breadfruit from Tahiti to the British West Indies in 1787. Regrettably, it is impossible to say for certain exactly how the government was persuaded to engage in the Breadfruit Expeditions. Similarly, it is not known just what Banks' role was in influencing this decision. As was the case with so many other projects in which Banks was involved there are no records of the details. This lack of documentation was largely due to the fact that Banks discussed the issues personally with the government officials involved, especially if one of the participants was the King. It was not uncommon for George III and Banks to stroll through Kew Gardens discussing matters of importance, the result being a statement of official policy at the end of the tour of the Gardens. Regardless of the methodology involved, Banks did succeed in convincing the Pitt ministry that an expedition to collect breadfruit and transfer it to the British Caribbean was vital for the region's continued viability.

The actual mechanics of the Breadfruit Expeditions are not of primary importance here, as they have been covered in detail by others.[16] Of more significance is the recognition of Banks' influence in these proceedings and his motivation. Briefly, Banks' initial plan for the collection of breadfruit was linked to the establishment of the penal

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14. *TBL*, p. 885 (3 Feb. 1787).
15. Ibid., p. 787 (20 June 1786).
16. See, for example, G. Dening, *Mr Bligh's Bad Language* (Cambridge, Cambridge University Press, 1992); D. Oliver, *Return to Tahiti. Bligh's Second Breadfruit Voyage* (Melbourne, Melbourne University Press, 1988); and G. Kennedy,*Captain Bligh. The Man and His Mutinies* (Trowbridge, Duckworth, 1979); Mackay (1974).

colony at Botany Bay, New South Wales. The need for an overseas penal colony had been a matter of government discussion throughout the 1780s and several sites were selected and rejected before New South Wales was agreed upon (partly due to Banks' enthusiastic description of the region). Once the location of the penal colony was decided, Banks recognized an opportunity for collecting breadfruit for the West Indies. His original plan was that one of the ships involved in the transport of criminals to Botany Bay would continue on to Tahiti after leaving the penal colony. Upon reaching Tahiti the ship would take aboard a number of breadfruit trees. Deciding to accomplish as much as possible with one trip, Banks also indicated that the same ship, on its way to Tahiti, was to first stop at New Zealand to collect two tubs of the flax, *Phormium tenax*, which Banks had spoken of so highly after his return from the *Endeavour* voyage. This plan had been seriously considered: Banks had drawn up specific instructions for David Nelson, who had been appointed the expedition's gardener on 1 March 1787, detailing the route from Britain to the West Indies by way of New South Wales, New Zealand, and Tahiti.[17] However, for whatever reason, Banks' opinion shifted, and by the end of March 1787 he had determined that the Breadfruit Expedition should not be a part of the already planned voyage to Botany Bay, but a separate project altogether. What caused Banks to make such an about-face on this issue is not entirely clear although it is known that on 30 March Banks sent Charles Jenkinson, the Baron Hawkesbury, a paper stating that he had reconsidered the initial proposal.[18] In this dispatch Banks indicated that it would be too difficult for one of the ships used to transport prisoners to Botany Bay to be properly outfitted on the coast of New South Wales for such a specialized purpose as transporting live breadfruit trees. In addition, it would not have been possible to acquire enough barrels, needed for planting the

17. *TBL*, p. 632 (1787).
18. There is the unlikely possibility that Banks had a private agenda from the beginning. It could be that Banks only proposed combining the expeditions as a means of reducing expenditures (something sure to impress the government). Once Banks had convinced the government of the necessity of transplanting breadfruit to the British Caribbean (which he had been advocating for years) and had gained official recognition of the project he may have concluded that there was no way the ministry could withdraw its support from the expedition, regardless of what he was to subsequently propose.

breadfruit, from the fledgling penal colony. There might also have been difficulties in convincing the owners of the transports used to convey the prisoners to New South Wales to carry an unprofitable cargo of plants to the West Indies. Consequently, Banks concluded that a ship should be outfitted in England and that the side trip to New Zealand should be abandoned.[19] The only purpose of the expedition would be to collect breadfruit and transport them to the British West Indies.

This small incident demonstrates the influence that Banks had acquired with the government since the early 1770s. When Banks had attempted to tailor Cook's second expedition to his own tastes he had been sharply rebuked. Fifteen years later Banks was not only able to initiate a separate overseas expedition with a single letter, but personally to plan the expedition's route and ports of call. Clearly, his opinion had come to be highly valued. By way of example, William Bligh, the one man who should have had the most right to complain about the organization of Breadfruit Expedition, had nothing but praise for Banks' planning. In the first chapter of his book concerning the subsequent mutiny, Bligh wrote that "...the preparations for executing the object of the voyage...were completed according to a plan of my much honoured friend, Sir Joseph Banks, which, in the event, proved the most advantageous that could have been adopted for the intended purpose."[20]

The details of the first Breadfruit Expedition were carried out over the next few months. A ship was purchased by the Admiralty and named, appropriately enough, *Bounty*. Modifications to the ship were made, not the least of which was the conversion of the great cabin to a plant house, in deference to Banks' instructions.[21] The day after the *Bounty* left dry-dock on 14 August 1787 to take on her crew and provisions, Thomas

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19. *TBL*, p. 450 (30 March 1787).
20. W. Bligh, *The Mutiny on Board H.M.S. Bounty* (Canada, Markham, 1961), p.13. Dening, pp. 20-21 and pp. 65-66, suggests that Bligh's devotion to Banks stemmed from a desire to be the recipient of Banks' patronage which Bligh believed would aid him in reaching that which he coveted so much: the upper ranks of the Royal Navy.
21. It was just such an alteration to a ship that had caused such intense friction between Banks and the Admiralty fifteen years earlier.

Townshend requested that Banks draw up the final instructions for the two gardeners, David Nelson and William Brown.[22] Banks wrote back with instructions for the watering and protection of the breadfruit trees during transport. In an unintentional prediction of the disaster that was to come, Banks hoped that the Master and crew of the *Bounty* would not think it a grievance to give the plants the majority of the accommodations and water aboard the ship.[23] There was, however, one brief incident of confusion, quickly corrected, concerning the specific orders that Lieutenant Bligh, for whom Banks had secured the command of the *Bounty*, was to follow. For some reason Bligh gave Sir George Yonge the impression that he knew nothing of his mission.[24] This alarmed Banks to some degree, as he was quite aware that it was he who would be blamed if Bligh was insufficiently instructed.[25] As it turned out, Bligh had been read his orders but had never actually seen them. This was quickly rectified and the problem solved.[26] By the middle of October the *Bounty* had taken on her final provisions and had begun the ill-fated voyage to Tahiti. The subsequent mutiny that resulted in the failure of the first Breadfruit Expedition and Bligh's spectacular 3,600 mile journey to safety in an open boat have been the subject of considerable work. However, these events have little bearing upon the role Banks played in the organization of the Breadfruit Expeditions and therefore shall not be discussed here.

Although the first attempt at transplanting the breadfruit to the British West Indies met with failure, neither Banks nor the planters of the British Caribbean abandoned the project. Samuel Williams Haughton, Speaker of the Jamaican House Assembly, was particularly concerned with maintaining Banks' good will: he recognized the extent of Banks' influence and his ability to initiate a second breadfruit expedition. Haughton conveyed to Banks the thanks of the entire Jamaican Assembly for his efforts to benefit the

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22. *TBL*, p. 825 (15 Aug. 1787).
23. Ibid., p. 826 (Aug. 1787).
24. Ibid., p. 885 (7 Sept. 1787)
25. Ibid., p. 885 (9 Sept. 1787) and p. 886 (14 Sept. 1787).
26. Ibid., p. 886 (14 Sept. 1787).

West Indies.[27] Despite the Nootka Sound Crisis of 1790, which nearly resulted in a war between the British and Spanish over the northwestern coast of North America (which would have necessitated the mobilization of the Royal Navy), preparations were made for a second Breadfruit Expedition. Again, Banks played a prominent role, conversing with government officials, speaking with the King, and generally keeping the whole proceedings moving along. His instructions to James Wiles and Christopher Smith, the two gardeners selected to accompany the *Providence* and the *Assistance* on this second voyage, were similar in may respects to those he had given to David Nelson, the gardener on the first expedition.[28] Making better use of the gardeners than he had on the first expedition, Banks dispatched further instructions for Wiles and Smith, discussing the additional collecting of other objects of natural history (birds, shells, insects, and the like) for which Banks would pay them.[29]

Unlike the first expedition, the second proved successful. Bligh touched at St. Helena during the return voyage, depositing approximately five hundred plants at the island's botanical garden. The remaining breadfruit trees (about five hundred in number) were left at Jamaica. They grew well and within a few years numerous breadfruit trees had been transferred from the Jamaican Garden to surrounding parishes. By 1800 breadfruit had become firmly entrenched in the British West Indies. However, despite the success of the transplantation the results were not what had been expected. Banks and the supporters of the Expeditions had envisioned the breadfruit becoming the staple food of the West Indies' slave population. It must have been quite disheartening to the plantation owners to discover that many of the slaves disliked eating breadfruit, insisting they preferred yams and plantain.[30]

While the breadfruit never succeeded in becoming the primary item of food in the British West Indies, the Breadfruit Expeditions demonstrate the influence and impact that

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27. Ibid., p. 401 (10 Jan. 1789).
28. Ibid., pp. 869-870 (25 June 1791).
29. Ibid., p. 870 (16 July 1791).
30. Cited in Mackay (1974), p. 77.

Banks had within the Empire. Throughout the organization of both expeditions Banks held the pivotal role. He not only proposed the plan to the British government but he chose the route the dispatched ship would follow, recommended the type of ship needed and the equipment it should carry, selected the gardeners, secured Bligh's position, and wrote detailed instructions for the Captain and crew alike. In addition, the expeditions conclusively demonstrated that commercially valuable species could be transported effectively from one place to another. The fact that the breadfruit did not live up to its (unreasonable) expectations was unimportant: the project demonstrated the feasibility of such an action, opening the way for future movement of commercially significant plants and animals.

The Merino Sheep

Charles Lyte called the attempt to acquire Spanish merino sheep by the British, in which Banks was involved, the "Patriotic Plan".[31] While Lyte incorrectly credits Banks with the initial suggestion for stealing merino sheep away from the royal Spanish flock, it is true that Banks quickly became the central figure in this scheme. Of particular importance was Banks' vast array of personal acquaintances which he had built up over the years through his copious correspondence. These connections proved to be essential to the successful completion of the plan to bring merino sheep to Britain.

The merino sheep of Spain had for centuries been regarded as the finest producers of wool in all the world. Originally from North Africa, the merino had been moved to Spain following the invasion by the Moors. Spain came to guard the sheep jealously from outsiders, forbidding the export of the merinos due to the economic significance of their fine wool. Other European countries purchased quantities of the fine merino wool from Spain to mix with locally produced wool. The policy of protecting the merino sheep from export, which ensured that only the Spanish had direct access to merino wool, ended

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31. Lyte, p. 183.

suddenly in 1766 when Louis Jean Marie Dauberton, a French naturalist, succeeded in bringing a sizable population of merinos (or, more probably, sheep with some amount of merino blood) to France as part of a treaty between the French and Spanish royal houses.[32] Dauberton's collection of merinos was destined for commercial application. It was not long before his merinos were being crossed with local sheep in Saxony and Silesia for the large scale production of merino wool.[33] With the French now possessing merinos of their own the status quo, in which all European countries relied equally on purchases of fine wool from Spain, was destroyed. The British wool industry would surely have suffered if something had not be done to return an equality to the market.

Colonel R.F. Greville, who was equerry to King George III at this time, is generally credited with planting the notion in his monarch's mind that Britain should circumvent the Spanish edict against the exportation of merinos and establish a population of the sheep on English soil.[34] When the King instructed Greville to investigate means by which the merinos could be brought to Britain without creating an immediate international incident, Greville made inquiries of Banks. So it was that Banks became officially involved in the project. The value of securing a British flock of merinos would have been obvious to Banks. Though not as exotic, by far, as the curious animals he had seen during the *Endeavour* voyage, as an owner of large agricultural lands in Lincolnshire he could easily see the benefits that could be garnered through such a project. On the most basic level, the merino sheep would be an economic benefit in and of themselves as many British agriculturists would wish to possess a merino flock of their own. In addition, the British textile establishment would no longer have to buy merino wool from Spain. Establishment of a British supply of merino wool would not only eliminate the costs incurred by shipping the wool from Spain to Britain, but also channel the money spent on the wool back into the British economy.

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32. O'Brian, p. 220.
33. Lyte, p. 183.
34. R. King, *Royal Kew* (London, Constable and Co., 1985), p. 99 and Cameron, p. 201.

While the King became interested in merinos in 1787 Banks had, in fact, already acquired merinos of his own several years prior to this, proving once again that science could exist outside of the political realm. Banks had received a gift of merinos from a friend in France. Pierre Marie Auguste Broussonet, a French botanist turned zoologist, was one of the multitude of European scientists with whom Banks corresponded. In March 1784 Broussonet wrote to Banks to inform him that there was an experimental breeding population of merinos in Burgundy.[35] Six months later Broussonet promised Banks a merino ram and ewe of his own.[36] The correspondence between the two scientists continued, with Broussonet asking for a sample of wool from Banks' home county of Lincolnshire and a discussion about a plan of Broussonet's to cultivate tea.[37] Finally, a year after Banks was informed about the Spanish sheep in Burgundy, Broussonet was able to reassure his friend that he now had two merinos in his possession ready for transport to Britain.[38] After working out a few final details, Broussonet dispatched the two sheep, each wearing an iron collar stamped with Banks' address, from Paris towards England.[39] The two sheep were taken to Banks' residence at Spring Grove. He had two coats made from the wool of his new sheep, effectively making himself the first man in England with clothes made of fine merino wool which had not come from Spain. Therefore, when Banks was approached by Greville and the King concerning the acquisition of a flock of merinos that would form the breeding stock for a British merino industry, he was already aware of the benefits to be incurred by Britain with such a project. Again, Banks wrote to Broussonet explaining his needs. The French scientist appeared willing to help Banks, although he was not certain how many sheep he could procure. He informed Banks that Louis Jean Marie Dauberton, the French agriculturist in charge of the French flock of merinos, was willing to part with fifteen or twenty of the sheep if they were to go

35. *TBL*, p. 158 (11 March 1784).
36. Ibid., p. 159 (29 Sept. 1784).
37. Ibid., p. 159 (6 Dec. 1784) and p. 159 (28 Jan. 1785).
38. Ibid., p. 159 (10 March 1785).
39. Ibid., p. 161 (16 June 1785).

exclusively to the President of the Royal Society.[40] One might speculate that Dauberton's agreement to provide the President of the Royal Society with a gift of merino sheep placed Banks in a delicate situation. Banks had long maintained that science should be politically neutral. To accept Dauberton's sheep as a gift of a fellow scientist and then turn and use the sheep to start a British merino breeding stock could have been contrary to Banks' beliefs. In addition, such an action on Banks' part could have seriously damaged his reputation as President of the Royal Society in the eyes of foreign scientists who would subsequently have reason to question requests for information or specimens. After a long period of indecision Dauberton did send Banks nearly fifty sheep in early 1789.[41] However, the uncertainty of the supply of French sheep coupled with their lack of merino purity and the difficult position accepting a gift from a fellow scientist and then applying it to a national endeavour would have placed Banks in prompted him to seek out other suppliers of merinos.

Even while trying to gain access to French sheep Banks was formulating plans to acquire pure merinos directly from Portugal or Spain. It was after Banks failed to secure a meeting with the King at Kew Gardens on 10 August 1787 that he announced he was ready to act. Banks had wished to receive the King's permission to initiate proceedings to secure two rams and four ewes of the "finest Spanish breed".[42] His concern was that if he did not act quickly the Spanish flocks of merinos would leave their summer pastures for over wintering in Portugal, during which time the sheep would be inaccessible. Banks' efforts paid off, as indicated by a letter to him from the King in November 1787 in which the King informed Banks he was pleased that a small flock of sheep was due to arrive shortly, for he thought "it may be a means of improving the wool of this country which...is a most national object."[43] It was also the expressed wish of the King that further efforts be made to acquire merinos through Banks' sources in Portugal.

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40. Ibid., pp. 164-165 (14 May 1787).
41. O'Brian, pp. 222-223.
42. *TBL*, p. 355 (10 Aug. 1787).
43. Cited in Cameron, p. 202.

Banks' connections with Portugal dated back to 1766 when he stayed in Lisbon for six weeks during his return voyage from Labrador and Newfoundland, when he met the English merchant Gerard de Visme, a natural historian of some repute. De Visme, seventeen years older than Banks, was well known to the Portuguese, including the Portuguese King who had been most impressed with de Visme's garden and estate. During Banks' stay, de Visme introduced the young botanist to the scientific community of Lisbon, including Joao de Loureiro and Domingo Vandelli.[44] Several years after their initial meeting Banks aided Vandelli in establishing a botanic garden in Lisbon. Later, in 1811, after Vandelli had fallen from political favor in Portugal, Banks helped secure a pardon for his old friend. It would have been men such as these to whom Banks turned when attempting to procure merinos. During the summer of 1789 Banks sought to use his Lisbon connections to acquire merinos, although this attempt met with failure.[45]

Banks had other avenues available to him, however. The previous year, 1788, had seen him engage in arrangements of questionable legality by which means merinos could be smuggled away from the Spanish flocks. One of Banks' agents assured him that certain of the shepherds who tended the flocks could be persuaded to overlook the loss of some of their sheep during the annual migration between the summer grounds in Old Castile and the over wintering pastures of Portugal. Subsequently, arrangements were made for British merchant ships, such as the *Betsy* captained by Michael Firth, to be in Portuguese ports to await the wayward sheep. In March 1788, Firth docked at Dover and sent a message to Banks: "I have got for you two ewes and one ram of the best Spanish breed and if you like them you may have more of the same sorte the next season as the Spanish contrabandys can get me any quantity I want..."[46]

By July 1789 George III's flock consisted of twenty-five pure merino sheep.[47] The numbers continued to increase over the next several years until 1800 when the King's

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44. Lysaght, pp. 176-177.
45. *TBL*, p. 355 (25 Nov. 1789).
46. Cited in Lyte, p. 184.
47. Cited in Cameron, p. 203.

flock was considered large enough for merinos to be auctioned off to British herders. During this time Banks continued to play an active role in the acquisition of merinos from abroad. In 1791 Banks intervened personally with the Custom House officials to have a ship carrying merinos released.[48] In addition, besides his involvement with the acquisition of merinos Banks actively oversaw the flock of merinos pastured at Kew and ensured that samples of the wool from the pure Spanish merinos and the cross breeds were tested.[49] Even after a misunderstanding with the King in 1805 (concerning the sale of a flock of merinos), the only serious breach between the friendship of Banks and George that is known, Banks continued to serve as an advisor to the Crown with regards to the merinos, although he did resign his official position as overseer of the King's flock.[50]

Ironically, in contrast to the difficulties in acquiring merinos through the late 1780s and early 1790s, during the Peninsular Wars Britain came to be almost overwhelmed with the sheep. After Spain allied itself with Britain against Napoleon in 1808 George III was often gifted by officers with large flocks of sheep captured from the estates of the Spanish who supported Napoleon. In 1809 a crisis, of sorts, was caused when 12,000 such sheep were destined to arrive in Britain. Banks dryly commented to Henry Bathurst that,

> The die is thrown & H.M. Ministers must abide by the hazards of the Casts. 12,000 Merino Sheep are embarked on board Transports in the Service of the Government under the Sanction of the Admiral on the Station and will arrive possibly in a week probably in a fortnight and certainly in the course of the present month of June. The animals are addressed by a letter scarce amounting to a Consignment to Sir John Sinclair as President of the Board of Agriculture and Mr. Cobbett the political writer.[51]

Banks continued to add that if the Government did not take care and arrange proper pasturage for the flood of sheep there would be a public outcry as the animals would surely die aboard the transports if not processed speedily. Such were the hazards of the "Patriotic Plan".

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48. Ibid., pp. 203-204.
49. *TBL*, p. 191 (11 Jan. 1794).
50. O'Brian, pp. 278-279.
51. *TBL*, p. 38 (10 June 1809).

As was the case with the transplantation of breadfruit trees from Tahiti to the British West Indies, the results of bringing merino sheep to Britain to alleviate British reliance upon fine wool from Spain were not as successful as had been expected. As was to be discovered, the merinos did not survive well in the damp British climate. All was not lost, however, for during the last years of the eighteenth century a new British colony was established which was ideally suited for raising merinos: New South Wales. The initial stock of merinos that found its way to the fledgling colony came from the Dutch garrison at the Cape of Good Hope. The garrison had surrendered to the British fleet under the command of Admiral Elphinstone on 16 September 1795. Colonel Robert Jacobson Gordon, the Dutch garrison commander, committed suicide, leaving a small flock of merino sheep to be claimed by the British. The sheep soon came to Banks' attention and it was he who ordered the majority of the flock transported to New South Wales over the next two years.[52] The sheep fared well in their new environment. The first commercial shipment of wool was exported from the colony in 1812, although it was not until the early 1820s that it was exported on a regular basis.[53] By 1828 New South Wales was one of the major suppliers of superfine and medium fine wool to England.[54]

From conception of the plan to introduce Spanish merino sheep into Britain in the mid 1780s, through the years of acquisition, and finally to the distribution of the merinos to New South Wales where they would come to thrive, Banks was a central figure. It was Banks' extensive connections with scientists and agents across Europe that allowed for the first merinos to be brought to Britain. His years of devotion to the plan, which both he and George III perceived to be of national importance, were largely responsible for the eventual success of the venture. Banks' actions helped to break the Spanish monopoly on the fine merino wool and strengthen the British woolen industry.

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52. Carter, p. 319.
53. E.A. Beever, "The origin of the wool industry in New South Wales," *Business Archives and History*, 5 (1965), p. 91.
54. J.P. Fogarty, "The New South Wales pastoral industry in the 1820s," *Australian Economic History Review*, 8 (1968), p. 114.

Hemp

By the early 1770s Britain was suffering from a lack of timber for the construction of new, and the repair of old, ships. Parliamentary committees were formed to investigate the matter and the East India Company was offered up as a sacrificial lamb. The poor management of resources of British oak and inadequate use of naval stores available from a variety of European and North American suppliers by government agencies was concealed by blaming the East India Company.[55] The severity of the timber shortage became painfully apparent to the Admiralty as their warships rotted away at dock or snapped their masts while at sea. This graphic display served as a convincing reminder not to allow the Navy, upon which Britain based its imperial power, to suffer such a shortage of vital supplies again.

During the *Endeavour* voyage Banks had suggested that the heavily forested coastlines of New Zealand and Australia might prove to be a significant source of timber for the construction of ships. However, there was a slight difficulty in the distance involved (although given time, a well equipped commercial shipping interest did develop in New South Wales). But timber was not the only supply required by the British. Equally important were naval stores of turpentine, pitch, tar, and hemp. The Admiralty and the East India Company had learned a harsh lesson from the timber shortage during the early 1770s. Consequently, when supplies of hemp used in making rope and rigging for Navy and Company ships alike appeared to be threatened action was taken swiftly. Remembering that Banks had been a long-time advisor to both the British government and the East India Company it is not surprising that he was heavily involved with attempts to secure new supplies of hemp.

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55. See Albion for an overview of the causes and effects of the timber shortage. M.R. Snyder, "A victim of circumstance: The East India Company and the timber bill of 1772," *Past Imperfect*, 1 (1992), pp. 27-47 examines the political consequences that resulted from the timber shortage.

The first record we have concerning Banks' involvement with hemp dates from 13 April 1785. In a letter, Thomas Morton, the Secretary of the East India Company, advised Banks of the Directors' opinion that the cultivation of Chinese hemp in England would be beneficial. Recognizing Banks' influence and the resources at his command, the Directors sent him seeds of hemp and flax collected by Company agents in the Far East. The Directors requested that Banks distribute the seeds to individuals who would be best able to experiment with them and report the results of attempts to raise the seeds in an English climate.[56] This is merely one example of Banks' involvement with the East India Company. Although never officially associated with the Company, Banks served as a trusted advisor to the Board of Directors on matters of natural history. In turn, the Company frequently sent packages of unusual seeds or plants to Banks. If any of these plants proved to be of use, the Company would certainly reap the benefits either through the exploitation of the finished product or as a distributor of the plant itself to interested customers. (As will be discussed later, the transport of seeds and plants between continents was a thriving and profitable business in the late eighteenth century.) Thus, the East India Company's interest in hemp is easily appreciated. If hemp could be grown in Britain there would be no need to buy it from other distributors, thereby reducing the cost of outfitting their ships which would, in turn, increase the Company's profits.

Besides the East India Company there were other parties equally interested in growing hemp either in Britain or in a British colony. The Royal Navy was just as dependent upon hemp as the East India Company. There was only a difference in motivation. The East India Company was primarily driven by financial considerations; the Royal Navy was concerned with their ability to field an effective force in the event of a war. Traditionally, the Royal Navy had purchased many of its naval stores, including hemp rope, from Russia and some of the Baltic countries.[57] Until the end of the eighteenth

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56. *TBL*, p. 289 (13 April 1785).
57. Some hemp was grown in Britain although there was never a large market for it and its quality was not highly regarded. Flax, used for the production of linen was more commonly cultivated. The dressing of

century Russia lacked the ability to either build or man its own navy. Russia relied heavily on Britain for skilled shipwrights and naval officers.[58] By 1800, however, Russia had learned a sufficient amount about ship construction and seamanship that they were no longer dependent upon the British. In M.S. Anderson's opinion it was these accomplishments that raised Russia to a new level of European significance: "No longer dependent on foreign states for ships or shipbuilders, able to train its own officers and men, commanded by really able Russian admirals...[Russia] could now confront the navies of most European states on a footing of equality..."[59] During the early and middle years of the eighteenth century there had been periods when the Anglo-Russian trade treaty had been strained. Usually, the focus of such disagreements was over whether the trade treaty would allow Russia to sell its naval stores to France.[60] However, by the beginning of the nineteenth century there was, for the first time, a very real possibility that Russia would cease to supply vital naval stores to Britain, either to hold them in reserve for the Russian navy or in a deliberate attempt to weaken British military and commercial naval power. The Admiralty concluded that it would be prudent to investigate new means of supplying the Royal Navy with naval stores, including hemp.

Banks, a recognized expert on issues concerning commercial biology, was called in. If the President of the Royal Society did not know the answers himself he would certainly be in correspondence with someone who did. A plan was arrived at whereby hemp would be grown in Ireland. The hope was that this hemp production would render Britain self sufficient, no longer to fear loss of vital supplies in times of war or national uncertainty. John Foster, later Baron Oriel, a politician and agriculturist, was Banks' liaison with the Navy Board. On April 18, 1801 Banks wrote to Foster to inform him that

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flax and hemp is essentially the same; men who were skilled in flax dressing could do the same task with hemp.

58. M.S. Anderson, "Great Britain and the growth of the Russian navy in the eighteenth century," *The Mariner's Mirror*, 42 (1956), p. 135.

59. Ibid., p. 146.

60. F. Spencer, "Lord Sandwich, Russian masts, and American independence," *The Mariner's Mirror*, 44 (1958), p. 116 and pp. 118-120.

he had purchased all the hemp that he could and had shipped forty qrs. of seed to Ireland.[61] Banks noted that due to drought the previous summer there was a "famine in Hemp". He added that if all went well the seed should be planted in Ireland by the end of May. However, Banks was somewhat skeptical of the success of the venture. In the letter he stated that he had studied the cultivation of hemp extensively and doubted that it would be an attractive crop for Irish farmers, largely because it fetched such a low price.

Foster responded promptly, thanking Banks for the acquisition of the hemp seed.[62] Foster stated that due to the poor financial returns in hemp farming that it would be difficult to find growers. The question of whether Irish farmers would prefer hemp growing to grazing was the major uncertainty. Still, Foster noted that as hemp grows well in reclaimed bog it could be offered as an inducement to grow the crop. Another point that Foster believed that he had to draw Banks' attention to was the matter of procuring hemp-dressers. Lord Liverpool had suggested that £30 a year would be ample payment to induce hemp-dressers to act for the Linen Board. After due consideration, however, it appeared that this would not be a sufficient fee. Foster suggested that payment based on the amount of work contracted for would be more appealing to the hemp-dressers.

In early May, Banks managed to find more hemp seed for the Navy Board, an additional six qrs.[63] The Navy Commissioners wrote Banks to request that this second shipment of seed be delivered as soon as possible to the Navy Office. The hemp seed would be transferred to Deptford where officers had already been instructed to place the seed on board the *Hope* and convey it as quickly as possible to Dublin.[64] Banks promptly carried out this request, pleased to be of service to the Navy Board.[65] On 15 May Banks found time to draft a reply to Foster's previous letter.[66] In it he confirmed that a total of 46 qrs. of hemp seed had been delivered to the Navy Board. Banks added that after due

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61. *TBL*, p. 341 (18 April 1801).
62. Ibid., p. 341 (24 April 1801).
63. Ibid., p. 341 (15 May 1801).
64. Ibid., pp. 630-631 (8 May 1801).
65. Ibid., p. 631 (9 May 1801).
66. Ibid., p. 341 (15 May 1801).

consideration he too believed that the project would suffer from a lack of skilled hemp-dressers. He suggested that the processing of the hemp could, instead, be carried out at flax mills, as the procedures for treating hemp were very similar to those used with flax. In this way at least one of the potential difficulties of growing hemp in Ireland might be overcome.

At the same time that Banks was acting as an advisor to the Navy Board he was also in independent correspondence with the East India Company. Some time earlier the Company had asked Banks if he could produce some hemp seed for them as they wished to attempt to grow the plant in India. On 6 January 1801, Hugh Inglis, a Director of the East India Company, wrote to Banks to thank him for the trouble he was taking in procuring hemp seed for the Company and asked that the seed be consigned to the Company's warf once Banks managed to acquire it.[67] Inglis was certain to add that any expenses incurred by Banks would be paid in full.[68]

To supply the East India Company with hemp Banks had turned to one of his many connections, Matthew Ives, a corn merchant who operated out of Spalding. Ives wrote to Banks on February 17, 1801 to assure Banks that while he did have the quantity of hemp requested, severe frost prevented it from being shipped.[69] Ten days later Ives was able to inform Banks that twenty-four sacks of hemp were bound for the India Warf in London.[70] A month and a half later Ives informed Banks that an additional eighty sacks of hemp seed, from Wisbech, was also being dispatched.[71]

Besides hemp seed, the East India Company had also requested that Banks find six men skilled in the cultivation of hemp for the project. These men were to travel to Calcutta where the hemp was to be planted. Banks' family estates were in the county of Lincolnshire. Consequently, when he was asked to provide men for the Company's

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67. Ibid., p. 295 (6 Jan. 1801).
68. The final cost of the hemp seed Banks procured for the East India Company was £234 14s. 0d. Ibid., p. 442 (18 April 1801).
69. Ibid., p. 442 (17 February 1801).
70. Ibid., p. 442 (27 February 1801).
71. Ibid., p. 442 (16 April 1801).

project he turned to his home. The men he selected were all sons of small farmers or laborers in Lincolnshire. All had some experience in hemp cultivation; in addition, two were also familiar with the techniques for processing the hemp into fibres suitable for making sailcloth or rope.[72]

With the final task of finding hemp cultivators for the East India Company completed, Banks' direct involvement with both the Navy Board's and the Company's attempts to cultivate hemp was concluded. Banks found no conflict in interest in acting for both the Navy Board and the Company, even though the first was motivated by responsibility to the State and the second by profit. He considered the Company's requests for assistance no less important than those from the Navy Board, an important branch of the King's Government. In addition, should either project prove successful, the results would be beneficial to the British Empire as a whole. Despite Banks' lack of appreciation or understanding of politics, he firmly supported the Empire and the expansion of British influence around the globe. As C. Lyte has noted, Banks was a confirmed colonialist, believing that British settlers would eventually spread the British influence across the world.[73] For this to come to pass though, the British colonies would require a strong Navy for protection and the ships of the East India Company for the maintenance of vital trade routes. By acting in a non-partisan manner and serving as an advisor to both the Royal Navy and the East India Company, Banks was best serving the interests of the Empire.

Despite the East India Company's efforts, their attempt to grow hemp in Calcutta proved unsuccessful. In a letter dated 3 June 1803 the six Lincolnshire men who had been selected by Banks to cultivate the hemp wrote to Banks with an unfavorable report of their progress.[74] All were in poor health and maintained that their pay was inadequate to the

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72. Ibid., p. 324 (1801) and p. 295 (1801).
73. Lyte, p. 172.
74. *TBL*, p. 324 (8 June 1803).

cost of living in Calcutta. In addition, the hemp was not growing well as the soil in the region surrounding Calcutta proved to be unsuitable for the purpose.

With India, at least for the moment, closed as a source of hemp production, Britain needed to look to other options. As Banks had already played an active role in the hemp projects in the past it is not surprising that he continued to do so. In late 1807 and early 1808 Banks was corresponding with Joseph Whidbey, a Fellow of the Royal Society, and also a dockyard superintendent and civil engineer.[75] Together the two men attempted to produce a stronger hemp rope. The stronger the rope, the less hemp would actually be needed, conserving vital supplies. In addition, Banks procured samples of different types of hemp not regularly used by the Royal Navy for Whidbey to test. The hemp sent to Banks from Bombay proved to make poor rope. Much more promising was the rope made from Bengal sun-hemp.[76] It proved to surpass the best Petersburg rope in strength. Banks and Whidbey engaged in another project which involved tarring hemp rope. Whidbey reported to Banks that he tested two ropes made from the same hank of hemp. The first had been treated with common tar, the second with a teak-tar which Banks supplied through one of his many connections. The former broke at 3,848 pounds of pull, the latter at 5,980.[77] This information was duly passed on to the Admiralty by Banks who was careful to stress that it was Joseph Whidbey who performed the actual experiments.[78] Banks was nothing if not modest of his own involvement in projects.

The fact that Banks worked with Whidbey on tests of rope strengths is not surprising. Both were Fellows of the Royal Society. Indeed, Banks' Presidency of the Society can not be overlooked in any of his undertakings. The Royal Society was known throughout learned circles worldwide. Banks, as President, was constantly being petitioned for assistance, advice, or was sent gifts of seeds, plants, artifacts, and all manner of natural curiosities. Had Banks never become the President he would still have carried

75. Ibid., p. 867 (22 Nov. 1807 and 15 Jan. 1808).
76. Ibid., p. 867 (22 November 1807).
77. Ibid., p. 867 (15 January 1808).
78. Ibid., p. 631 (May 1808).

on an extensive correspondence with scientists across Europe and North America because of his museum and library in his home in Soho Square if for no other reason. Nevertheless, the extent of his correspondence and his renown would not have been as extensive and his ability to influence the Empire lessened had he not been the President.

As President of the Royal Society, the most prestigious of the learned organizations in Britain, people felt no hesitation in sending Banks anything they believed might be beneficial. It would have come as no surprise to Banks when a sample of rope appeared in his mail in the middle of January 1809. Thomas Greetham, a Liverpool rope maker, sent it to him with a letter explaining that the rope was woven from fibres derived from *Musa sapientum*, the banana tree. He reported that there was an abundance of banana in the West Indies and considered that such rope may be suitable for use by the Royal Navy. It was his belief that substitutes for hemp must be found since "owing to present relations with Russia, the supply of Hemp from there will cease..."[79] Banks examined the specimen of rope and agreed that the Admiralty might be interested in making use of banana fibre ropes. It was Banks' opinion the fibre might be a good substitute for hemp, and if so, "an important article of commerce."[80]

Responding to questions concerning the banana rope, Greetham wrote back to Banks explaining that the banana fibre was sent from Demerara by a man named Grant who was capable of supplying any quantity of the material.[81] Preparation was particularly simple: nothing but drying the fibre in the sun and beating it with a mallet was required. Greetham explained that he had very little of the rope himself as the fibres were originally sent to Gladstones, a merchant in Liverpool, who distributed most of it as samples before proper trials could be performed. However, a sample had been sent to the Admiralty so testing might have been feasible. Greetham added that he had experimented with the banana rope himself and found that it would bear somewhat more weight than hemp rope,

79. Ibid., p. 368 (19 January 1809).
80. Ibid., p. 368 (21 January 1809).
81. Ibid., p. 368 (27 January 1809).

but suffered a serious disadvantage in that it would not retain tar after submersion in salt or fresh water.

Intrigued, Banks contacted the Admiralty and received a reply from Sir Thomas Boulden Thompson, Comptroller of the Navy. Thompson reported that the trials conducted on the banana rope were disappointing, although he added that as there was very little rope to begin with a fair test could not be performed.[82] He added that more rope was sent for so that the tests could be repeated. While it appears that the banana rope did not compare particularly well against hemp rope (the inability to retain tar must have been particularly disturbing, as rot could quickly begin to weaken the banana rope once it was exposed to moisture), Sir Robert Barlow, at this time Commissioner of Chatham Dockyard, did believe that banana rope would be suitable for running rigging if hemp was unavailable.[83]

The quest for either a hemp substitute or a source of hemp supply outside the control of another European power would continue. Banks was involved in further experiments using different species of hemp and environmental conditions, helped largely by the fact that people continued to send him unsolicited samples of hemp.[84] Once it was generally known that the President of the Royal Society was interested in acquiring an item it became something akin to a test of national honour for good British subjects to supply it.

Banks' involvement in procuring hemp, or a hemp substitute, demonstrates a number of key features. The most significant was his close involvement with agencies within the British Government. When Banks first returned to Britain after the *Endeavour* voyage he was a novelty that the British public could appreciate. His actions as President of the Royal Society and his extensive correspondence soon made him indispensable as consultant on issues of national importance. By the first decade of the nineteenth century

82. Ibid., p. 817 (22 March 1809).
83. Ibid., p. 32 (March 1809).
84. J. Wray, for example, sent Banks samples of what he considered to be "the finest seed", adding that he expected a complete cargo of it to arrive presently on the *Alert*, Ibid., p. 882 (February 1809).

Banks had become such a familiar figure in the workings of the British ecological imperial policy that his participation was practically taken for granted.

Conclusion

Banks' involvement with the Breadfruit Expeditions, the merino sheep, and the attempt to cultivate hemp in India demonstrate two significant features. First, Banks was an active participant in the application of commercial biology to projects designed to benefit the British Empire. Second, during the final decades of the eighteenth century the British government demonstrated growing interest in the benefits commercial biology could play in maintaining the Empire. Banks had been made aware of some of the applications of biology to the Empire during his three year *Endeavour* voyage. Fifteen years after his return the British government was receiving its own enlightenment in the applications of commercial biology.

While the government had been slow to realize the implications of commercial biology, other British agencies, such as the East India Company and colonial plantation owners, had been aware of the applications for years. It was in the ranks of the East India Company and the planters that Banks found men who shared his vision of the benefits biological applications could bring to the Empire. Perhaps it was the profit motive that drove the East India Company and planters to see the value of natural resources. Or perhaps the critical factor involved living and working on the edges of the Empire, cut off from the traditional attitudes cultivated in Britain itself. It has been argued by historians of science that the greatest advances come from the frontiers of civilization. Regardless of the reasons, Banks was driven to see commercial biology used to strengthen the British Empire. One can only suppose that had it not been for his close friendship with George III, Banks' goals would have taken far longer to be realized.

The closing years of the eighteenth century demonstrate a shift in the perceptions of what made an empire strong. Military power was still, of course, considered of great

importance, as were economics and national pride. However, underlying each of these factors it is possible to see of the role applications of commercial biology could play. Hemp production, for example, would not only have helped to maintain British naval forces but also eliminate an economic reliance upon Russia and the Baltics for the supply of rope and cordage. The acquisition of flocks of merino sheep not only had economic benefits for the British textile industry but was a subtle flaunting of the inability of the Spanish to protect their prized sheep from the British. The race to transplant breadfruit to the West Indies was, in part, a demonstration of national pride between the French and British. In addition, it was considered that breadfruit would have positive economic repercussions on the sugar industry by providing a less expensive supply of food for the slave populations. Breadfruit could also prove useful to the West Indies as a subsistence crop in the event of future war-time interruptions of supply lines from Britain, as had been seen during the American Revolutionary War.

At the centre of the changing attitudes towards the imperial uses of biology was Banks. Advisor to the King, government, and the East India Company, Banks moved in the highest political circles, always promoting the merits of commercial biology. The name "Sir Joseph" became synonymous with the ability to bend Nature to the will of the Empire. As shall be seen in the next chapter, Banks' pinnacle of reshaping the world of biology to suit imperial needs was nowhere more evident than in his work with the network of colonial gardens that he helped organize and develop during the last decade of the eighteenth century.

Colonial Gardens: A Network of Imperial Assets

Introduction

In historical accounts of British gardening, the nineteenth century is generally considered to have seen the greatest advancements and developments. Nineteenth-century British gardens are remembered not only for their picturesque beauty, being carefully sculptured and landscaped to perfection, but for their commercial, scientific, and imperial value. L.H. Brockway, for example, called attention to the "important role in empire-building" of the Royal Gardens at Kew.[1] In another case, D.R. Headrick has demonstrated the significance of plants (e.g., quinine and the opium trade) to the British Empire.[2] While the value of commercial biology (specifically botany) to imperial expansion is demonstrated in these works the focus is principally on the nineteenth century. Little attention has been directed to the importance of the Royal Gardens at Kew and its associated colonial gardens to British imperial expansion in the eighteenth century.

This neglect of the British gardens of the eighteenth century and their role in imperial expansion by historians is somewhat peculiar considering that botanical contributions to British interests during the nineteenth century saw their foundation in the previous century. Many of the British gardens were founded through the assistance of Joseph Banks. While Banks held, perhaps, the most influential role in promoting British imperial expansionism through the application of commercial biology, he was by no means alone in this function. The second half of the eighteenth century saw a general realization of the potential benefits available from nature by European scientists, philanthropists, and governments. The global exchange of seeds and live plants went a long way towards the goal of improving and benefiting different parts of the world. However, such exchanges of seeds and plants, while exciting, would not have been nearly as significant to Britain had it not been for a number of large, well organized gardens which were developed or founded in the last quarter of the eighteenth century.

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1. Brockway, p. 10.
2. D.R. Headrick, The *Tools of Empire* (New York, Oxford University Press, 1981).

The importance of the Royal Gardens at Kew as an international clearing house for seeds and plants has been generally recognized and accepted. Banks' agents, as well as private contributors, traveled the world collecting exotic plants and returned their finds to the gardeners at Kew. Once received, the seeds or plants were grown and studied. If a plant proved to have the potential for benefit, Banks would have samples dispatched to a British colony which had, hopefully, the correct climate and conditions to see the plant flourish.

While the Royal Gardens served admirably in this regard, as time progressed and the importance of commercial biology became apparent, it was necessary for subsidiary gardens to be founded. These gardens, located in the colonies, could do much of the initial study and investigation of newly discovered plants. In addition, the colonial gardens would serve as well equipped nurseries for shipments of plants dispatched from the Royal Gardens to the colonies. Equipped nurseries had the advantage of decreasing the loss of plants shipped to the colonies from Britain, as trained gardeners would be on hand at the colonial gardens to deal with the new arrivals.

There were other reasons to sponsor the development of colonial gardens. Underlying many of Banks' interests and projects was a desire to see the British Empire prosper. To this end the establishment of organized colonial gardens could play a significant role. These gardens could fulfill a variety of functions that would strengthen and enhance the Empire's position not only in the distant colonies but in Britain as well. First, the gardens served as centres for expansion. Second, they provided sites for the development of resources. Third, exotic flora, a symbol of imperial status, could be displayed for the public at gardens, reinforcing the extent of the Empire to British subjects as well as to foreign states. Finally, the development of strong colonial gardens served to link widely separated colonies together in a network of intercommunication and exchange of resources, knowledge, and familiarity. This chapter will first examine the development of the Calcutta Botanic Garden to show Banks' involvement with colonial gardens and will

then conclude by discussing the four functions colonial gardens maintained in strengthening the British Empire.

The Calcutta Garden

By the mid to late 1780s, almost fifteen years after Banks' appointment as the unofficial director of the Royal Gardens, the British government began a process of establishing, funding, and officially sanctioning a series of colonial gardens. The Calcutta Botanic Garden, which would come to play an important role in the cultivation of Indian and Asian plants, saw its origins in a letter to the East India Company's Court of Directors from Colonel Robert Kyd, secretary to the military department of inspection in Bengal on 13 April 1786.

While there were other colonial gardens, such as those at Jamaica, St. Vincent, and Barbados, the Calcutta Botanic Garden serves as an excellent example of the role gardens played in British imperial expansionism. It demonstrates admirably many of the traits Banks desired with regards to the trade and cultivation of commercially viable plants. For example, the Calcutta Garden was something of a national endeavour. While Colonel Kyd had initially consulted the East India Company about founding a garden, Banks was involved from an early date. Banks' involvement, in turn, ensured that government officials, and most likely the King, were aware of the progress of the Garden. The result was a garden, originally sponsored by a chartered company, that acquired a significant role in the empire-wide network of plant exchange and agricultural development. In addition, the Calcutta Garden had the ability to cultivate local plants and send to and receive from Kew a variety of foreign plants. Finally, the location of the Calcutta Garden was of considerable significance. Not only did it have easy access to Indian plants, but also specimens brought in from the South Pacific, New South Wales, New Zealand, and China. With gardens in the West Indies and Calcutta, British interests were represented in key locations around the globe.

The Kyd Years

As mentioned above, Colonel Robert Kyd (1746-1793) recommended to the Directors of the East India Company (EIC) that a garden be founded in Calcutta in 1786. Kyd had obtained a cadetship in 1764 and was appointed to the Bengal infantry in the same year. He was a man of cultivated tastes with a long standing interest in botany and horticulture.[3] Over twenty years in India had taught him much about the nature and uses of plants native to India and the surrounding region. In addition, his long association with the sub-continent had made him aware of the benefits that proper horticultural research and development could bestow upon the region. Kyd's initial proposal was based on his belief that cultivation of the sago tree could help prevent the recurrent horrors of famine and plague that affected the region. Cholera epidemics and other diseases were periodic hardships that affected India. These outbreaks of disease often coincided with famine. While famine did not cause the epidemics, it is clear that such epidemics were substantially worse during periods of famine. Therefore, introduction of an additional food source could, perhaps, decrease the severity of the epidemics that not only affected the Indian population, but also the lower ranks of the Bengal infantry that especially suffered from cholera.[4] Kyd proposed the transplantation of the sago tree from the Malay peninsula to Calcutta, followed by subsequent distribution of the tree to other centres in India.[5] In many respects this proposal was similar to that which resulted in the Breadfruit Expeditions: a desire to provide better nutrition.[6] The Directors of the EIC apparently

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3. S. Lee (ed.), *Dictionary of National Biography*, Vol. 11 (London, 1909), p. 348.
4. D. Arnold, "Cholera and colonialism in British India," *Past and Present*, 113 (1986), pp. 121, 123, 125, & 128.
5. *TBL*, p. 510 (13 April 1786).
6. Kyd, however, appeared to be more aware of the value of the crop he advocated importing than the promoters of the Breadfruit Expeditions. Banks, and others, believed that breadfruit would provide complete nutrition for the entire slave population in the West Indies. This was due to misplaced romanticism concerning the lifestyle of the Tahitians and partially because of an incomplete understanding of the role of the breadfruit in the Tahitians' diet. Kyd did not fall into this trap and recommended that no attempt be made for the Sago crop to replace traditional Indian crops, but that it should serve as a valuable reserve food supply if other crops failed (*TBL*, p. 510 (13 April 1786).

accepted Kyd's rationale and resolved that the Superintendent of the Straits Settlements, Colonel Francis Light, should be directed to procure sago trees and transport them to Fort William where Kyd resided.

Kyd had apparently been aware of the benefits of transplanting valuable species for some time prior to his proposal concerning the sago tree. Roughly a decade earlier he had moved some cinnamon trees from Assam to Fort William. Following his initial success, he acquired other specimens from the Butan Mountains and Ceylon. With this experience behind him, Kyd informed the EIC Directors, in a second letter (1 June 1786), that his observations had indicated that a botanic garden at Calcutta would not only have humanitarian value, but could serve as a useful nursery for the collection of commercially valuable and rare plants. Along with cinnamon and black pepper (from which he reported good yields), he suggested that Dacca cotton, indigo, tobacco, coffee, sandal wood, and tea might prosper at Calcutta.[7]

At the same time that Kyd was proposing the establishment of a garden at Calcutta, the garden on St. Vincent was being rebuilt. To a certain degree this garden, located in the West Indies, provided an incentive for the foundation of an Indian garden. In September 1786 Kyd received a dispatch from the Secretary at War requesting Indian plants for the garden at St. Vincent. In a reply letter, Kyd took the opportunity to promote the concept that a garden at Calcutta would greatly facilitate production and exchange of plants between India and the West Indies in the future.[8] If a garden were to be established in Bengal, then indigenous plants could be more readily dispatched, not only to other gardens, but to private planters located anywhere in the British Empire.

Kyd was not alone in his thinking. Others, including Banks, were clearly aware of the same possibility and the valuable contributions such an establishment could offer.[9] Banks was, undoubtedly, impressed by Kyd's desire to design the garden with scientific

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7. *TBL*, p. 510 (1 June 1786).
8. Ibid., p. 511 (September 1786).
9. Ibid., p. 885 (15 May 1787).

principles in mind. In effect, the Calcutta Garden would serve as a miniature version of Kew, fulfilling much the same purpose as the Royal Gardens in Britain. Kyd intended that the garden should be,

> not for the purpose of collecting rare plants as things of curiosity or furnishing articles for the gratification of luxury, but for establishing a stock for disseminating such articles as may prove beneficial to the inhabitants as well as the natives of Great Britain, and which ultimately may tend to the extension of the national commerce and riches.[10]

His proposal was well received by the Directors of the EIC and early in 1787 Kyd was appointed Superintendent of the newly founded Calcutta Botanic Garden.[11]

Kyd lost no time in making his intentions clear. Almost immediately he issued orders that valuable fruit trees be acquired from China.[12] Kyd had ambitious plans. He requested that the Chinese fruit trees include specimens of the earliest and latest bearers of each class. His intention was to experiment with the trees' growing seasons. Along with the Chinese plants he was hopeful of extending the seasons of European vegetables at the Calcutta Garden.[13] These early endeavours set the Calcutta Botanic Garden distinctly apart from most earlier British colonial gardens: it was a working garden as opposed to carefully landscaped pleasure garden. Following Banks' efforts at the Royal Gardens at Kew, Kyd was determined to make his garden a centre of research and development from which he could dispense valuable plants not only throughout India, as had been his initial idea, but throughout the British Empire.

It was not long before donations and contributions began to arrive at the newly founded garden. Kyd reported the first donations, a mango and a nanna tree, were bestowed on the garden by Colonel Thomas Deane Pearse in June 1787.[14] Shortly after Pearse's contribution the *Thetis* docked in Bengal bringing with it a collection of European fruit trees. Unfortunately, the trees, a gift from David Cumming, perished during transit

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10. R. Kyd, cited in Brockway, p. 75.
11. *TBL*, p. 511 (18 May 1787).
12. Ibid., p. 511 (18 May 1787).
13. Ibid., pp. 511-512 (8 June 1787).
14. Ibid., pp. 511-512 (8 June 1787).

due to defective packaging.[15] This set-back was soon off-set by further donations however, and Cumming quickly dispatched another batch of plants. William Jackson, Registrar of the Court of Justice, Gillespie, an officer in the Bengal Artillery, and Colonel Pearse further added to the garden's stock. Lewis Barretto commissioned a shipment of cacao-trees from Manila and a Guatemalan indigo to be transported to the garden.[16] In addition, Chinese trees, including muskat date trees and mulberry trees, arrived. The mulberry trees were considered especially important as they were required as the host plants for silk worms (silk production being another commercial application in which Kyd believed the Calcutta Garden should become involved).

The Calcutta Botanic Garden continued to progress and grow both in size and the variety of species it contained. Kyd carefully oversaw all aspects of the garden and remained true to his original goals of providing both commercially valuable products and better food supplies for India. There were, however, some difficulties convincing the indigenous people to use the newly imported and cultivated food plants. Kyd complained that this necessitated the development of a whole nursery for each kind of plant since the people of India would not readily grow the imported plants in their own agricultural plots. These problems were not universal though. Kyd found that most of the local population accepted the sago and date trees readily enough, although the northern regions where wheat was grown would not eat or grow rice, and the southern settlements which produced rice would not develop wheat cultivation. Potatoes were universally disliked by the local population, resulting in the cultivation of the plant for the European population alone.[17] Nevertheless, the first several years after the Calcutta Botanic Garden's founding did see some success in producing viable sources of new food-plants.

Commercial endeavours progressed as well. One such venture during Kyd's time as director of the Garden was the attempt to cultivate tea in Bengal. Kyd was avidly

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15. Ibid., p. 512 (13 June 1787).
16. Ibid., p. 512 (2 Oct. 1787).
17. Ibid., p. 513 (23 Sept. 1789).

interested in Chinese plants, as demonstrated by his experiments with Chinese fruit trees. While this line of investigation could result in a valuable local trade, exporting fruit was not commercially viable due to the long shipping distances. Tea, however, was easily shipped. In addition, of all the East India Company's Eastern exports, tea was, financially, the most successful.

The East India Company was unable to export much of the indigenous Indian industry to Britain. Acts of 1700 and 1720 prevented the sale in Britain of any stained or dyed cotton cloth produced in India. Similarly, wrought Indian silk could not be exported to Britain. While these products could be exported to many of the British colonies a combination of huge shipping distances and inefficient shipping practices reduced the profits of such ventures. However, by the second half of the eighteenth century many British subjects had come to view tea as an essential beverage. This necessitated the importation of huge amounts of tea. Despite having to purchase the tea through a consortium of Chinese suppliers located in Canton and to pay heavy import taxes the EIC still managed to average £6 million profit a year on tea sales in Britain between 1774 and 1784.[18] This profit increased rapidly with the passing of the Commutation Act in 1784, which reduced the average tax assessment on tea from 119% to 12.5%, increasing the EIC's profits from tea dramatically and making tea the single most valuable commodity the Company exported. Tea sales rose immediately to £19 million per year.[19]

Nevertheless, the fact remained that the East India Company was still the middleman in the export of tea from Canton to Britain. Dealing with the Chinese tea consortium was not only an additional expense, but was subject to the whims of the Chinese authorities which none of the European merchants appeared to understand fully. It was reasoned that if a successful Bengal tea industry could be established it would significantly reduce British dependence upon the Canton market and increase the EIC's

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18. P.J. Marshall *Problems of Empire: Britain and India, 1757-1813*, (London, Barnes & Noble, 1968), p. 89.
19. Ibid., p. 90.

profits. As early as January 1788 Kyd was recommending that the supercargoes should re-establish their communications with purchasing agents in Limpo (a region near which tea was cultivated). He hoped that plants could then be purchased and skilled local gardeners could be hired to return with the tea plants to Calcutta to supervise the venture.[20]

The East India Company's Directors forwarded Kyd's plans for cultivating tea in Bengal to Banks who, on 27 December 1788, provided the Company with a detailed report on the possibilities of establishing a tea industry in India. Banks described in depth the various kinds of tea, the climate and soil required for each, and likely locations where they might be effectively grown. Black teas, for example, wrote Banks,

> may certainly be cultivated with success in the Northern parts of the province of Bahar and Coosbeyhar, for instance, where the latitude and the cooling influence of the neighboring Mountains of Boutan give every reason to expect a climate iminently similar to the parts of China in which Black Teas are at present manufactured...[21]

Banks developed a careful strategy for the introduction of teas to Bengal through the Calcutta Botanic Garden. It was his opinion that "all undertakings of new manufacture should commence with articles of inferior quality..." The rationale was simple and elegant. Black tea, considered to be a low grade tea, would be less difficult to prepare and was easily affordable by the "lower orders of people". Once a local market was established the more expensive teas could be cultivated for those of "distinguishing palates".[22] Banks believed that once a local industry in black tea was established and had proven to be economically viable, the cultivation of green tea could then be attempted.

> If then the Culture of Black Teas is once established in Bahar and the inhabitants of Boutan are invited by proper inducements they will certainly undertake that of the Green and thus by a gradual change the whole of the Tea Trade will be transferred into that quarter.[23]

Banks' approach to the problem of establishing a tea industry in Bengal was a long-term one. The gradual introduction of low grade teas to the Indian economy to induce local

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20. *TBL*, pp. 512-513 (23 Jan. 1788).
21. Cited in Cameron, p. 73.
22. Ibid., p. 73.
23. Ibid., p. 73. Note that there was not a realization by Westerners at this time that black and green tea were derived from the same plant.

farmers to begin cultivation of the more expensive green teas would take years. It was uncertain how long the East India Company would have to wait before showing a profit. The fact that the EIC willingly embarked upon Banks' program, especially considering the financial difficulties facing the Company during the later years of the eighteenth century, is a testament of the Directors' faith in his expertise in matters relating to commercial biology.

Overall, Banks found Kyd to be a competent supervisor of the plan to begin the cultivation of tea in India and wanted to use the Calcutta Garden as the regional headquarters for the project. Banks was whole-heartedly supportive of Kyd's plan to hire gardeners experienced in cultivating tea, believing this crucial to the success of the project. He stressed that "liberal terms" should be offered to any such gardener who would take employment at the Calcutta Botanic Garden. Banks considered that 20 acres should be initially committed to the venture and that the land be "already cleared and prepared" before the gardeners arrived. Ideally, if the plot of land were "lying under very nearly the same latitude as Canton", it "would not fail to suit in every particular this infant adventure."[24] The plan called for the Chinese gardeners to instruct local farmers in the care and cultivation of tea. Subsequently, the farmers would return to their own lands and cultivate tea on their own, teaching their neighbors how to raise tea at the same time. In this manner the tea industry would be spread throughout India.

While Kyd's plan to cultivate tea in Bengal was, perhaps, his most elaborate, it was by no means the only aspect of commercial biology in which he was involved. Before his death Kyd reported the arrival of numerous economically significant plants and animals. Cinnamon, coffee, and indigo were established in the Calcutta Botanic Garden by the latter half of 1789.[25] A year earlier Kyd had visited Sylhet personally to procure cassia, pepper, and sandal-wood.[26] Silkworm eggs were requested from China once the mulberry trees were sufficiently established, and Kyd reported that cochineal, the insect from which a red

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24. Ibid., p. 73.
25. *TBL*, p. 514 (10 Nov. 1789).
26. Ibid., p. 513 (30 Jan. 1788).

dye was produced, thrived at the garden, although steps were still required before proper cultivation of the insect could begin.[27] In addition, Kyd had begun to collect medicinal plants and indicated that after study he would inform the Medical Board of the plants' properties.[28] Such careful preparation and systematic planning allowed the Calcutta Botanic Garden to continue functioning smoothly following Kyd's death in 1793.

The Roxburgh Years

William Roxburgh (1751-1815), a botanist, was chosen by the Directors of the EIC to succeed Kyd as superintendent of the Calcutta Botanic Garden. Roxburgh had already had a long association with Banks, having sent the President of the Royal Society correspondence, seeds, plants, and natural curiosities since at least 1779. The exchange of knowledge between the two men continued uninterrupted following Roxburgh's move from Samul Cattah to Calcutta. If anything, Roxburgh's appointment as superintendent resulted in an even greater involvement of Banks in the garden at Calcutta due to the long established personal relationship between the two men.

Roxburgh's first dispatch to Banks from Calcutta, on 1 December 1793, included a consignment of plants from the Calcutta Botanic Garden to the Royal Gardens at Kew. In addition, Roxburgh mentioned his hopes that he would be able to induce the Directors of the EIC to send useful plants to the Calcutta Garden, especially from the West Indies and America.[29] The stage was now set for the second phase of development of the Calcutta Botanic Garden. Kyd's efforts had seen the garden established and the introduction of a variety of plants from different parts of India, China, and the South Pacific. Under Roxburgh's supervision the Calcutta Botanic Garden was to become more involved in a world-wide exchange of seeds and plants between other gardens (including Kew, St. Vincent, Jamaica, and Barbados), private horticulturists, explorers, and botanists.

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27. Ibid., pp. 512-513 (23 Jan. 1788) and p. 513 (23 Sept. 1789).
28. Ibid., p. 513 (30 Jan. 1788).
29. Ibid., p. 715 (1 Dec. 1793).

Perhaps Roxburgh's enthusiasm for plant exchange stemmed from the fact that he was, by profession, a natural historian, unlike Kyd who, though a thoroughly competent botanist, had made his career in the military and was a botanist after the fact. By the late eighteenth century the exchange of natural curiosities, seeds, plants, scientific drawings, animals, and the like was common-place among natural historians. Banks, for example, had long been involved in such distributions of specimens.[30] Some of the first people Banks exchanged plants with were his friends from the *Horace's Head* where naturalists met to discuss issues in science. Within this group of friends natural curiosities were often exchanged. The trading of plants, animals, and fossils between Banks and Thomas Pennant in the late 1760s is only one such example of the active dealing in natural curiosities between natural historians during this period. Following Banks' returned to Britain from the *Endeavour* expedition, his friends flocked to his house to view the wonders he had brought back. Banks was quite free about giving away many of the items he had collected, happy to be able to add to his friends' collections. J.C. Beaglehole dryly commented that "...Banks was generous with his collections. He gave away things. ...I have a lingering feeling that, if Banks had been more professional and less of a great man, he might have left the world much more in his debt."[31] Roxburgh's experiences would have been similar to Banks'; indeed, he and Banks had exchanged items of interest for years.

Roxburgh's long friendship with Banks served him well and he had little difficulty pressing the President of the Royal Society for assistance in acquiring new plants for the Calcutta Botanic Garden. Within months of arriving at Calcutta, Roxburgh had written Banks, asking for him to urge the Directors of the East India Company to dispatch American and West Indian seeds, since his own efforts were not yielding results fast

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30. For example, Ibid., p. 5 (7 July 1802), p. 118 (20 Nov. 1774, May 1776, & 1 May 1783), p. 444 (25 Jan. 1809), p. 452 (5 May 1789), p. 561 (30 March 1790 & 13 July 1790), & p. 787 (20 June 1786).
31. J.C. Beaglehole, "Eighteenth century science and the voyages of discovery," *New Zealand Journal of History*, 3 (1969), p. 113.

enough.[32] Along with this request he sent another packet of seeds and a box of plants for the Royal Botanic Gardens at Kew. Roxburgh's efforts were prodigious: nearly every letter to Banks was accompanied by a packet of seeds, a box of living plants or roots, or diagrams of Indian botanical specimens. On 29 May 1796, for example, Banks wrote Roxburgh to inform him that the latest shipment of specimens had arrived in Britain safely, and noted that, with the exception of the collection brought home following Bligh's second Breadfruit Expedition, this shipment was the largest single addition received at one time at Kew.[33] The majority of the plants and seeds eventually found their way to the Royal Gardens at Kew, from whence they could be re-distributed to other gardens throughout the British Empire.

Of course, Roxburgh was not limiting his activities to packing novel plants into boxes and dispatching them to Banks on the first ship returning to Britain. He was, like Kyd, involved in botanical endeavours of his own. Much of his time was devoted to a careful cataloguing of the plants he encountered. He completed over 1,200 accurate drawings accompanied by descriptions of plants, many never before seen in Europe. Banks saw that Roxburgh's works were published in a series of *fasciculus* so that other natural historians, botanists, horticulturists, explorers, and physicians could benefit from the discoveries. So prodigious was Roxburgh's work that by 1798 Banks was publishing two *fasciculus* a year, with more drawings arriving on a regular basis by ships returning from India.[34]

Part of the reason that such drawings proved so important to natural historians, horticulturists, and gardeners was because of the growing acceptance of the Linaean system of classification that distinguished between plants largely on the basis of their reproductive structures. Extremely accurate depictions of newly discovered plants were required to avoid inadvertent classification errors. It was impractical to transport an entire herbarium

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32. *TBL*, p. 715 (14 Jan. 1794).
33. Ibid., p. 715 (29 May 1796).
34. Ibid., p. 717 (9 Aug. 1798).

into the field during a collecting expedition.[35] Experience and common sense dictated that herbariums be rendered into a book format if they were to be of any use to plant collectors. As commercial botany became increasingly important, especially in the colonies, an entire trade developed around the production of illustrated botanical books. By the early nineteenth century there were legions of hand-finishers whose only job was to colour printed engravings of plants.[36] The drawings made by Roxburgh have come to be only a small part of the more than one million sketches, drawings, and paintings that make up the current portfolio of botanical art which resides at the Royal Gardens at Kew.[37]

Although the Kew Gardens were accumulating an increasing number of plant drawings, the continued acquisition of new species of live plants continued apace. If anything, during the 1790s Banks became even more concerned with increasing the diversity of species at Kew. To further this goal Banks ceased collecting for himself, devoting all his resources towards the Royal Gardens.[38] Any specimens he received were passed on to the Gardens, regardless of the source. In addition, Banks actively commissioned and purchased plants from collectors and gardeners for Kew. Humphry Marshall, for example, filled a number of orders for Banks during the early 1790s.[39] Marshall (1722-1801) was an American Quaker who had become interested in natural history in the 1750s. He constructed one of the earliest greenhouses in America and soon abandoned his stonemasonry trade to concentrate on gardening. By the late 1760s he was supplying collectors in America, Britain, and Europe with a variety of plants indigenous to North America. His clients included Benjamin Franklin, Lord Suffield of Norfolk, Monsieur Francois Barbe-Marbois (the legate of the French Royal Garden in Paris), and the Earl of Barbancon of Brussels.

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35. The notable exception to this was, of course, the *Endeavour* voyage which was equipped with the largest collection of specimens and apparatus ever taken on a collecting trip to date. Banks did, however, also rely heavily on published drawings and descriptions of plants to make his classifications.
36. R. Mabey, *The Flowering of Kew* (London, Century, 1988), p. 8.
37. Ibid., p. 9.
38. *TBL*, p. 750 (2 April 1795).
39. L.C. Belden, "Humphry Marshall's trade in plants of the New World for gardens and forests of the Old World," *Winterthur Portfolio*, 2 (1965), p. 117.

It is unclear how Banks learned of Marshall's plant trade. Marshall had long corresponded with English Quakers, some of whom may have been acquaintances of Banks. Regardless of the initial means of introduction, Banks must have approved highly of Marshall for they shared many similar goals for botany, including the goal of commercial applications for plants. In his catalogue of American trees, *Arbustrum Americanum*, Marshall stressed the virtue of American timber for economical purposes.[40] A German aristocrat, the Marquis of Baden, certainly took this advice to heart, importing 3,000 Weymouth firs (white pine), 8,000 larches, black and white pitch pine, Jersey fir, and red cedar to his forest near Pforzheim.[41] While Banks' transactions with Marshall were more modest they also involved the introduction of new, or rare, North American plants into Britain via the Royal Gardens at Kew. Between 1786 and 1793 Banks ordered at least five boxes of plants which included St. Andrews Cross, polygala, portulaca, violas, anemones, martagona lilies, asters, and a variety of grasses and ferns. In addition, Banks ordered 200 weight of fresh Ginseng roots, a request that saw Marshall's nephew journey over 200 miles to western Pennsylvania in search of adequate specimens.[42] Following this order Banks simply instructed that Marshall charge "three guineas and put in plants in proportion as you shall think just and right. I say this because I find you fair and honest, such a one as I can put confidence in."[43] This was no small praise that Banks bestowed. The plant trade involved considerable expense: a London nurseryman, for example, was reported to have paid £20 for a scarlet azalea.[44] Exceptionally large bills could quickly add up and, as Banks was acting in the King's name when buying plants for the Royal Gardens, he was held accountable for all purchases and expenses incurred. Nevertheless, Banks continued to trust Marshall's judgment and succeeded in expanding the selection of North American plants at the Royal Gardens. In turn, many of these plants

40. H. Marshall, *Arbustum Americanum: The American Grove* (New York, Hafner Publishing, 1967 (originally published 1785)), p. ix.
41. Belden, p. 113.
42. Ibid., p. 117.
43. Cited in Belden, p. 117.
44. Belden, p. 118.

and others were redistributed to the colonial gardens, such as the collection of fruit trees dispatched to Calcutta on the *Princess Royal* in 1794.[45] The Royal Gardens at Kew and the colonial gardens prospered.

Benefits of Colonial Gardens to the British Empire

Banks had grander designs for colonial gardens than simply using them as depots in the transportation of exotic plants around the world. Development of colonial gardens was in keeping with Banks' goals to utilize commercial biology to the benefit of the British Empire. It should be stated that Banks was an expansionist at heart. He firmly believed that Britain had a responsibility to be a civilizing force in the world. The organization and establishment of colonial gardens, reinforced by the strong centralized Royal Gardens at Kew, served to strengthen the British Empire in several ways.

Four aspects associated with the colonial gardens, and the collection and trade of plants in general, were significant with respect to imperialism. The gardens served as centres, or bases, for further expansion, as sites for the acquisition and development of resources, as displays of imperial status, and to foster an interconnection between the widely separated colonies, settlements, bases and Britain. The following section considers the possible reasoning behind Banks' promotion of colonial gardens and the plant exchange. Remembering that Banks was an expansionist and a firm believer in the benefits of the British Empire, his efforts to promote and establish colonial gardens can be viewed as an effort to support British imperial expansion.

Base of Operations and Expansion

Colonial gardens served as bases of operation. Once a colonial garden was established it was no longer necessary for all of the resources required for botanical exploration and development to be dispatched overseas from Britain. Colonial gardens

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45. *TBL*, p. 120 (1 Aug. 1794).

such as the Calcutta Botanic Garden took on many of the functions previously carried out by the Royal Gardens at Kew. Colonial gardens allowed collectors to explore new regions, gather botanical specimens, and cultivate the plants themselves rather than having to first send them to Britain, which meant the directors, gardeners, and collectors attached to the colonial gardens could save considerable time. Rather than having to wait months or years for gardeners at Kew to report on the properties of plants discovered overseas, the facilities at colonial gardens allowed for rapid study of new discoveries. If a plant was discovered to be valuable then collectors could quickly be dispatched to retrieve more samples, or the colonial gardens could begin a large scale cultivation of the plant on its own grounds. Consequently, the establishment of colonial gardens could serve to increase the rate of discovery and development of new botanical species.

Permanent, or at least large and well equipped, bases of operation were essential to the success of botanical expeditions. The resources needed to provide adequate supplies and equip a natural science expedition were huge. Naval expeditions had one distinct advantage over inland expeditions: the ability to transport large numbers of documents, equipment, and specimens. The difficulty with naval expeditions, of course, was that they were relatively limited in their ability to penetrate the interior of the regions they were exploring. The establishment of colonial gardens served to, at least partially, alleviate the difficulties facing an inland expedition. Collectors could carry the basic implements necessary for the expedition, then return to the garden to catalogue, describe, paint, press, cultivate, and investigate the plants discovered during the expedition. Therefore, despite being limited in terms of supplies, which would reduce the length of an inland expedition, more expeditions could be carried out (eventually the resources carried by a ship would be exhausted whereas an established garden would be able to replenish continuously the supplies needed to support expeditions). Collectors could make repeated trips inland,

return with their finds which would be left in the care of the staff of the colonial garden, and turn inland again on another expedition.[46]

Well equipped gardens would have the effect of increasing the number of expeditions possible by distributing the tasks required for an expedition between collector and the staff of the garden: the plant collector would concentrate on collecting; additional chores could be carried out by others. During Roxburgh's directorship of the Calcutta Botanic Garden, for example, he employed as regular staff a sizable contingent of Hindu artists, possibly including Haludan, Vishnu Prasad, and Gurudayal, three Indian artists known to have made botanical paintings for Europeans.[47] These artists, who did not travel with the expeditions, painted the copious quantities of plants that Roxburgh and other collectors brought back to the Garden.

There would, of course, be other benefits to an increase in the number of expeditions besides the discovery of new plant species. Principle among these would be the exploration of new territories and the subsequent mapping of the regions. Mapping was deemed an essential component of British expeditions. Maps made during the *Endeavour* voyage by Cook or the early ventures into the interior of New South Wales, following the establishment of the penal colony, provided Britain with vital knowledge of overseas territories. Captain Thomas Hurd, Hydrographer of the British Royal Navy, was adamant that accurate charts were essential if Britain was to maintain its military superiority.[48] Sir John Barrow, Secretary to the Admiralty between most of 1804-1845, took Hurd's position a step further. Barrow maintained that all scientific knowledge (although one must suppose he placed particular importance upon mapping as he was one

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46. Examples of plant collectors working from permanent bases or gardens include Francis Masson in South Africa, George Caley in New South Wales, William Kerr at the Celon Botanic Garden and, of course, William Roxburgh at the Calcutta Botanic Garden.
47. Mabey, p. 91. Indian artists produced many of the paintings for Roxburgh's *Plants of the Coast of Coromandel*. Banks oversaw the publication of this work, selecting 300 paintings from the 2,500 that Roxburgh sent back to Britain. The book was issued in twelve volumes between 1795 and 1820.
48. B.M. Gough, "British-Russian rivalry and the search for the Northwest Passage in the early 19th century," *Polar Record*, 23 (1986), p. 304.

of the founding members of the Royal Geographical Society) was of importance for the protection and development of the British Empire.[49]

While the strategic significance of maps can not be overstated, there were other benefits to be derived from them as well. Many maps, or artists' representations of maps, were printed for the general public. Examples can be seen in the depiction of Botany Bay, New South Wales, based on the charts made by Captain Cook and Governor Phillip.[50] The British public was fascinated with the overseas territories discovered during the late eighteenth and early nineteenth centuries; the books, maps, and artistic representation of Cook's three voyages, for example, were immensely popular, not only in England, but in France, Holland, Germany, and Italy.[51] A. Frost attributes a similar phenomenon seen in the British Romantic poets who set their works in far away lands as a desire to be "armchair travelers about the greater globe".[52] While most did no more than observe the maps, or read the travel diaries with intense interest, some acted upon what they saw and immigrated to the newly discovered territories. Once settlement of an area had begun, an imperial claim to the region was established and, eventually, new colonies were formed.

Resources

The establishment of colonial gardens in the last two decades of the eighteenth century allowed for both a higher rate of collecting botanical specimens and a more rapid appreciation of which plants would prove to be beneficial. Banks, and by extension those collectors, gardeners, and overseers of the gardens he patronized, had long been interested in commercial biology. Plants could be valuable in three ways: economically, medicinally,

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49. Ibid., p. 304.
50. A. Phillip, *The Voyage of Governor Phillip to Botany Bay* (Adelaide, Libraries Board of South Australia, 1968 (originally published in 1789)).
51. P.J. Marshall and G. Williams, *The Great Map of Mankind* (London, J.M. Dent & Sons, 1982), p. 269.
52. A. Frost, pp. 8-9.

or ornamentally. Economically valued plants, of course, provided financial returns. Tea, for example, was of exceptional financial importance to the British Empire. The East India Company invested considerable time and money into attempts to cultivate tea in British India believing that, if the project were a success, the returns would far outweigh the costs. Besides generating revenue through the sale of economically valuable plants, the plants could cause an increased interest in the area in which they were grown. This interest would, in turn, cause others to invest in the region hoping to capitalize on the profits to be made. The consequence was an expansion of British interests into new regions and the expansion of the Empire.

Medicinal plants, besides being of considerable economic value, could aid in the general health of the population. Humanitarian ventures were, for many natural historians, of considerable interest. Banks, for example, was loath to involve himself in any affair that was politically motivated. In addition, he always considered himself a fiercely loyal British subject. Despite this, Banks often agreed to sanction ventures if they were based on humanitarian reasons, even if the those involved in the project were foreigners.[53] The improvement of the human condition superseded Banks' concern with national boundaries. Similar motivation was seen in Colonel Kyd who hoped that the Calcutta Botanic Garden could alleviate human suffering in India. To this end he cultivated a variety of medicinal plants in the Garden.[54] The discovery of medicinal plants also served as a justification of the continued maintenance of botanic gardens: the application of medicinal plants was a demonstration to the general public of the benefits which could be incurred. In addition, the discoveries made from certain medicinal plants, such as quinine, allowed for further development of colonial territories.

While some plants were revealed to hold medical applications others were simply pleasing to the eye. Ornate flowers, such as *Ixias*, *Pelargonium*, *Gladiolus*,

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53. See, for example, *TBL*, pp. 220 (10 May 1787), 286 (18 July 1798), 400 (11 Jan. 1815 & Jan 1815), & 906 (9 June 1796).
54. Ibid., p. 513 (30 Jan. 1788).

Mesembryanthemum, and especially *Strelitzia reginae* (commonly known as the Bird of Paradise flower; Banks provided the taxonomic nomenclature in honour of Queen Charlotte's family seat) which Francis Masson collected in South Africa were immensely popular with the British public.[55] British hobbyist gardeners created such a demand for the South African perennials that James Lee's nursery specialized exclusively in the plants returned from the Cape by Mason. Horticultural interest in exotic flowers, shrubs, and fruit trees increased as the Royal Gardens at Kew and the various colonial gardens increased in size and complexity. Newly introduced flowers were eagerly acquired by private individuals.

The popularity of cultivation of exotic flowers was likely one of the reasons behind Banks' involvement in Lord Macartney's 1803 diplomatic mission to China. Banks had been aware of the huge diversity of Chinese plants for years. Whang Tong, a Chinese scholar, visited London in 1775 where he moved in literary and scientific circles. Although undocumented, it is certain that Banks met Whang Tong during this visit for the two men later corresponded. Several years prior to Macartney's mission, Whang Tong sent Banks a set of books on the history of China, samples of tea, and a number of Nankeen flowers.[56] When Banks learned, subsequently, of the planned diplomatic mission to China he could not pass over the opportunity to learn more about Chinese plants. Banks approached the East India Company, suggesting that any plants collected in China could be transferred to the British West Indies. For this venture to work, however, he believed that two trained plant collectors would be needed. In addition, as many of the plants would be studied at the Royal Gardens, it was only natural that one of the two men should be a gardener trained at Kew.[57] The Directors of the EIC accepted Banks' terms and even agreed to provide a £100 expense account for William Kerr, the Kew gardener (later superintendent of the Ceylon Garden, established 1810) who would accompany David Lance, the other plant

55. Mabey, p. 22 and 77.
56. *TBL*, p. 866 (18 June 1796).
57. Ibid., p. 295 (8 April 1803).

collector.[58] As was so often the case, Banks had apprised the King of the venture and reported the King to be well pleased with the botanical aspects of Lord Macartney's mission.[59] Furthermore, added Banks, it was the King's view that British botany and agriculture would be much improved by the sending of Kerr and Lance to China.[60]

Banks' instructions to Kerr demonstrate the emphasis placed upon the expedition. First, the King had appointed Kerr "collector of plants in foreign lands", a position that Banks said could easily lead to advancement if Kerr's conduct was meritorious. Second, Kerr was to make specific inquiries into Chinese methods of cultivation and to pay strict attention to any plants producing fibre or other economic products. In particular, he should seek plants that could be acclimatized to other parts of the world.[61] In additional directions to David Lance Banks stressed that Chinese fruit trees were also to be considered plants of high priority for collection, suggesting several locations outside of China, including Malta and Levant, where the plants could eventually be cultivated.[62] These instructions indicate that the expedition was sanctioned by the Crown and considered by the King to be of national importance. It was stressed that economically viable plants were of particular interest, and that it was Banks' intention to transplant plants from China to the Royal Gardens at Kew and other colonial gardens, or even colonies lacking organized gardens, for the purpose of large scale cultivation. Any plant, for example, that could be used to produce cordage would be a prime candidate for collection and transplantation, as Banks had indicated to Kerr in the expedition instructions.[63]

While not a complete success, the botanical expedition fared substantially better than the diplomatic mission. Although most of the live plants that Kerr sent back to the Royal Gardens at Kew perished during the voyage, dried specimens, drawings, and seeds

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58. Ibid., p. 296 (12 April 1803).
59. Ibid., p. 296 (28 April 1803).
60. Ibid., p. 296 (April 1803).
61. Ibid., p. 486 (18 April 1803).
62. Ibid., p. 520 (23 April 1803).
63. At this time Banks was involved in projects with both the Royal Navy and the EIC to cultivate hemp within the confines of the British Empire. See Chapter 2 of this thesis for an account of Banks' involvement with hemp.

arrived intact. In addition, besides sending plants to Britain, Kerr dispatched a collection of fruit trees to the garden on St. Helena, which apparently reached the island alive.[64] If nothing else, this success validated the effort Banks had earlier directed towards the establishment and development of the colonial gardens.

Imperial Display

Ornamental plants were quite significant in the promotion of the concept of British imperial expansion. The British public flocked to gardens to view the ornamental plants gathered from around the world. It was not uncommon for more than £300 to be collected at the bridge leading to the Royal Gardens at Kew on Sunday from people who spent the afternoon in the Gardens.[65] Rare plants and colorful flowers from around the world were arranged for the edification of an enthusiastic public. Nowhere else in Britain was there so elegant a display of the extent of the British Empire. In addition, collections of plants from exotic locations, such as China, the Pacific islands, and Brazil, tantalized the public with images of what lay just beyond the boundaries of the Empire, hinting that the Empire could eventually possess the land as it did the plants. The displays in the British gardens (both in Britain and in the colonies) were the best way for people to grasp the extent of the British Empire and other overseas interests. It was even possible for one to own a small piece of a faraway land by purchasing an exotic plant.

Gardens were not meant for a country's subjects alone: gardens were displays of prestige amongst nations. Most European countries attempted to maintain a royal or state sponsored garden that would, literally, showcase the fruits of its imperial labours. Exotic plants also came to have diplomatic significance. One such example can be seen in the collection of plants Banks personally selected as a gift for the Empress Catherine II of Russia in 1795.

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64. *TBL*, p. 486 (6 May 1806).
65. Mabey, p. 20.

Britain had relied heavily upon Russian supplies of naval stores throughout the eighteenth century. However, the series of commercial treaties between the two nations had expired in 1787, and Catherine was not eager to renew the agreement believing that Britain had controlled many aspects of Russian trade for too long. Renewal of the treaty proved troublesome for a number of additional reasons, including Russian expansionism resulting in open hostilities between Russia, Poland, and Turkey. Furthermore, following the lapse of the Anglo-Russian trade agreement, Catherine signed a similar treaty with France. However, the initiation of the French Revolution caused her to reconsider the commercial agreement, much to British delight, and Russia repudiated the link with France in 1790. Finally, by 1793 Sir Charles Whitworth, British envoy-extraordinary and minister-plenipotentiary at Warsaw since 1785, managed to arrange a reconciliation between Russia and Britain. In a clever diplomatic move, Whitworth suggested that the Royal Gardens at Kew could supply Catherine with a gift of exotic plants to adorn the landscape of the new Palace of Pavlovsk.[66] The Russian Empress had been a great admirer of British gardens for years, having written to Voltaire in 1772 to say that "I love to distraction these gardens in the English style - their curving lines, the gentle slopes the ponds like lakes. My Anglomania predominates over my plutomania..."[67] Consequently, the gift of British plants would serve as the final touch in the negotiation of the new Anglo-Russian trade agreement.

King George III requested that Banks personally see to the organization of the gift of plants. The King was magnanimous in his gift, instructing Banks to "...Select from the Royal Botanic Gardens at Kew as Compleat a Collection of Exotic Plants as can possibly be Spard..."[68] In addition, Banks was to detach a royal gardener from his regular duties to accompany the plants to Russia and, once in St. Petersburgh, to assist the Russian Empress in the establishment of the plants in her garden.

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66. Carter, p. 287.
67. Cited in Carter, p. 287.
68. Ibid., p. 330.

Banks oversaw all aspects of the King's gift to the Russian Empress. He personally designed the cabin in the hold of the ship which was to transport the plants to Russia and issued instructions concerning when the ship should sail and what precautions the captain of the vessel should take to ensure the survival of the precious cargo across the Baltic Sea.[69] It had been Banks' hope that his old friend, Captain Bligh, could carry the plants in his ship, the *Calcutta*. Banks reasoned that Bligh's "Experience in the Care of Plants at sea will be of great use to the undertaking." Besides his experience, Banks believed that Bligh's name would "add not a little to the Compliment indeed I think it will be Compleat if The Foreman of the Royal Botanic Garden attends the Plants as is intended & Capt Bligh Carries them".[70] However, the Admiralty would not spare Bligh's ship for this purpose and Banks was forced to make other arrangements.

Banks and William Townsend Aiton, Foreman of the Royal Gardens at Kew, selected the specific plants, seeds, paintings, and diagrams that would comprise the British gift. Two hundred and twenty-six species of plants collected from around the world were included.[71] The first entry in the catalogue of the plants was *Strelitzia reginae*, the much admired Bird of Paradise flower. More than half the plants were South African, many of which had been collected by Francis Mason, while others were collected from the British colony in New South Wales, Tahiti, New Zealand, and Madeira.

The effort was, apparently, a great success. Banks later reported that only three of the plants sent to Russia had previously existed in the Empress' gardens.[72] Catherine was greatly impressed. She spent hours learning the names of the new plants and personally drew each of them. In return, the Russian Empress felt compelled to reciprocate in kind, sending 25 plants and some 180 different seeds to the Royal Gardens at Kew.[73] While

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69. Ibid., pp. 332-333.
70. Ibid., p. 335.
71. Ibid., p. 338.
72. Ibid., p. 356.
73. Ibid., p. 355.

only one of the plants did not already exist in Britain, Catherine promised to send a collection of Siberian plants which she believed would prove to be more unique.

It is apparent that the exchange of plants had fulfilled a diplomatic function. For Britain to gift Russia with a large collection of plants from the Royal Gardens at Kew was a visible demonstration of the British desire to maintain close ties with Russia. It must be remembered that plants were a valuable commodity at this time. Exotic plants were generally guarded closely in the hopes that the plant would eventually demonstrate some commercial value. It was unusual for such plants to be given away to another country that could, in turn, exploit the plants' properties (consequently, exotic plants and seeds were often valued spoils of war).[74] While not pivotal to the renewal of the Anglo-Russian treaty, the gift of plants did serve as a gesture of goodwill between the British and Russian monarchs.

Interconnection of Regions

The establishment of colonial gardens, while allowing a certain degree of self-sufficiency, also served to draw the British Empire more closely together. With regards to self-sufficiency, colonies that sported established gardens had an added advantage. Such colonies were less likely to fail due to interruptions of supply lines during times of crisis.[75]

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74. Two examples include William Aiton's (chief gardener at Kew Gardens) attempts to secure the cargo of exotic plants captured from the French ship, *L'Union* in 1803 (*TBL*, p. 350) and Banks' distribution of La Billardière's collection of plants and animals to Queen Charlotte and the British Museum in 1796 (although Banks did end up returning the collection in the spirit of goodwill between scientists of rival nations).

75. There are a number of examples of settlements or colonies that either failed completely or were severely stressed when their supply lines were interrupted during a time of crisis. While admittedly earlier, in a time when supply lines were more tenuous, the Roanoke settlement, for example, was lost completely when the Spanish Armada prevented the expected return of ships carrying vital supplies. Another example is the difficulties faced by the British colonies in the West Indies. Wars always threatened shipping from England. For example, between 1688 and 1697 it was mostly New England ships that made it to Barbados (Dunn, p. 211). During the American Revolutionary War the colonies of the British West Indies were in danger of being cut off from their supply lines completely or invaded (see J.R. Dull, *A Diplomatic History of the American Revolution* (New Haven, Yale University Press, 1985 for an account of the diplomatic and military incidents in which the West Indies colonies were involved and J.R. Dull, "France and the American Revolution seen as a tragedy," in R. Hoffman & P.J. Albert (eds.), *Diplomacy and Revolution: The Franco-American Alliance of 1778* (Charlottesville, Virginia University Press, 1981), pp. 100-101 for commentary on the significance of Jamaica as a French target for invasion). The war seriously interfered with shipments arriving from Britain and, once the West Indies colonies declared their support for Britain, the Congress at Philadelphia imposed first a partial, then total, ban on trade with the British West Indies

The British Empire based its strength on its naval power. Maintaining overseas routes connecting scattered colonies to both the British Isles and each other was of crucial importance.[76] However, specific sea routes could not always be maintained. In times of emergency, be it war, the loss of ships to storms, or political conflict within the central government, those colonies that had their own gardens to provide support for the cultivation of essential crops (foodstuffs and medicines, for example) would manage far better during a crisis than those colonies that lacked a garden. In addition, colonies that possessed gardens could provide necessary supplies (along a less used route) to a colony that had lost its principle supply route for whatever reason. Even when the sea routes were open colonial gardens were an advantage. The hardier individual colonies proved to be, the less effort the Empire would have to expend supporting its individual components. Instead, resources could be allocated to the Empire as a whole or to projects designed to expand the boundaries of the Empire further.

Besides strengthening the individual colonies, and thus the British Empire as a whole, the presence of established colonial gardens also led to an increase in correspondence and trade between colonies. Communications passed between the people associated with the various colonial gardens. In the case of the gardens in the West Indies, for example, it was the colonies' political leaders and prominent merchants who were associated with the gardens. These communications between people associated with colonial gardens served to keep distant regions of the Empire informed about a variety of events. In addition, the colonial gardens were in close communication with the Royal Gardens at Kew (often through Banks himself).[77] These correspondences could serve to foster a sense of continuity between Britain and its colonies.

(L.M. Penson, *The Colonial Agents of the British West Indies* (London, Frank Cass and Co., 1971), p. 204).

76. Note that the establishment of a colonial garden provided the incentive for maintaining routes between individual colonies, especially colonies with gardens, for the exchange of plants, seeds, etc.

77. For examples of communication between Banks and St. Helena, New South Wales, Jamaica, and Barbados see *TBL*, p. 154 (17 June 1787 & 7 May 1791), p. 655 (20 Aug. 1801), p. 750 (20 Dec. 1794), p. 787 (20 June 1786), & pp. 850-851 (1785)

On a more practical level, the extensive correspondence between directors of the British gardens provided the colonies with needed resources. Once colonial gardens were established it was possible for plants to be dispatched directly between the different colonial gardens rather than waiting for requests to be answered by an agency in Britain. Of course, the directors of colonial gardens typically sent samples of the same plants they were growing to the Royal Gardens at Kew which served as the botanical clearing house for the British Empire as a whole. In this respect the Royal Gardens could be thought of as the central hub of a wheel that was comprised of different colonies on the rim. Sometimes it was easiest, and quickest, for the required resources to be sent from the Royal Gardens to a colony or from a colony to the Royal Gardens and finally to another colony. However, it was often most efficient for the colonies to deal directly among themselves.

Direct dealings between the colonial gardens could have helped in the establishment of trade routes. Colony-to-colony routes, some of which may have been uncommon prior to the establishment of the colonial gardens (which may have necessitated the requirement for such a route to be used), served both to expand the limits of the British Empire and draw the components of the Empire closer together. In addition, the plant exchange that increased rapidly in the late eighteenth and early nineteenth centuries necessitated the development of new technology. On numerous occasions Banks complained bitterly of the difficulty in transporting live plants over long distances. As mentioned earlier, Banks himself took a hand in designed the plant cabin for the ship that was to carry the gift of plants from Britain to Russia in 1795. Nevertheless, advancements were required, such as the development of closed greenhouses perfected in the mid-nineteenth century. Such a development vastly increased the survival rate of plants transported between colonies. Increased survival of plants meant fewer trips were required to stock a colony with a new species of plant, freeing ships for other tasks such as exploration.

Besides the practical benefits of being able to transfer plants between colonies for economic, agricultural, or medicinal purposes, plant exchange served to produce a unity

within the British Empire. South African plants from the British colony on the Cape were grown in Britain, India, the West Indies, and a number of other colonies. Similarly, plants from Barbados, Jamaica, and St. Helena found there way throughout the territories of the British Empire. Australia demonstrates the most extreme example of transplantation of exotic flora: the whole of modern Australia's crop plants were imported from Europe and the Americas.[78] Through the cultivation of plants from distant parts of the Empire the inhabitants of the colonies were able to appreciate the extent of the Empire of which they were a part. The idea of British imperial expansionism was reinforced when, for example, New Zealand flax, collected half a world away, was displayed to the British public at the Royal Gardens at Kew. Through the display of exotic plants in gardens throughout the British Empire the inhabitants of Britain and the British colonies could see that they did not exist in isolation, but as a part of an expanding whole.

Conclusion

The development of a number of well equipped colonial gardens served to link the British Empire together in a network designed to facilitate the application of commercial biology to imperial needs. Banks was by no means alone in the realization of the necessity for colonial gardens in this regard. However, it was Banks who had the political and social connections necessary to see colonial gardens developed to the point where they could play a significant role in British imperial interests.

Banks' involvement with colonial gardens was one of his most significant contributions to the establishment of commercial biology as a tool of the British Empire. In the years following Banks' death it became apparent that breadfruit had failed to become a primary food crop in the West Indies; steamships, which had seen their development during the early years of the nineteenth century, eliminated the need for hemp rigging; and the merino sheep, so prized for their wool, failed to thrive in Britain due to the damp

78. A.G. Price, *The Western Invasions of the Pacific and Its Continents* (Oxford, Clarendon Press, 1963), p. 184.

climate.[79] The gardens, however, survived into the nineteenth century to serve the needs of the British imperialism.

The twenty years following Banks' directorship of the Royal Gardens were fraught with difficulties for the gardens, it must be admitted. With the deaths of both Banks and George III there was no one of substantial power to provide the level of patronage and support the gardens required to fulfill their imperial service fully.[80] Despite this, the Royal Gardens at Kew and the various colonial gardens survived until Sir William Hooker assumed the directorship of Kew, ushering in a new era of productivity for the gardens.[81] Under the new guidance of Hooker the gardens once again served as useful centres for expansion, sites for the development of resources, displays of imperial status, and hubs for the transmission of communication and knowledge between the widely separated expanses of the Empire. Following the new interest in commercial biology seen in the 1840s the gardens were able to rapidly mobilize their resources to meet the needs the Empire placed upon them. The extent to which the gardens weathered the dearth of attention between 1820-1840 is a testament to the efforts that Banks exerted during the initial organization and development of the network of British gardens.

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79. The merino sheep did thrive in Australia and Tasmania. However, due to the shipping distances involved the exportation of Australian wool was not economically viable until the 1830s (Beever, pp. 91-92).

80. L. de Bray, *The Art of Botanical Illustration* (Hong Kong, Quarto Publishing, 1989), pp. 128 & 131.

81. William Hooker was a protégé of Banks'. It was Banks who planned Hooker's 1809 expedition to Iceland, just as it was Banks who, using his considerable personal influence, helped secure him the Glasgow Chair of Botany. Hooker became the director of the Royal Gardens at Kew in 1841. It was during Hooker's directorship that the Royal Gardens expanded from 15 acres to over 260 acres. For an account of the Royal Gardens under Hooker's directorship see M. Allan, *The Hookers of Kew, 1785-1911* (London, Michael Joseph, 1967).

Postscript

Recently, a growing dissatisfaction with traditional approaches has resulted in a revision of the study of imperial history. Commenting on trends in British imperial studies, P.J. Marshall noted that, "It is no longer sufficient to assume that empire can be related to a simple progression of British history from mercantilism to workshop of the world and eventually to industrial decline." Marshall added that it is insufficient for historians who study empire to content themselves with events that occurred within the boundaries of the empire. Rather, an awareness of the broad context of historical occurrences, both inside and outside the imperial borders, must be considered if the modern scholar is to appreciate imperial history fully.[1]

Marshall is by no means alone in his opinion that the focus of future studies in imperial history must change. With this goal in mind, P.J. Cain and A.G. Hopkins have initiated a reinterpretation of capitalism and imperial policy, directing attention towards "gentlemanly capitalism", that is, the importance of non-industrial influences on overseas development.[2] T.H. Breen provides another interpretation of capitalism and empire, declaring that "Consumer demand was the driving engine of economic change."[3] Still others, such as P.G.A. Pocock, aim to achieve an interactionist interpretation of imperial history, suggesting that the British Empire should not be thought of as the institutions which comprised the government, chartered companies, military, or society, but the mixture of different cultures and people that lived within the boundaries of the Empire.[4]

The reinterpretation of imperial history has not stopped with economics or inter-cultural interactions. A growing number of historians have become interested in the role that science has played in empire. Recently, A. Peyrefitte, in his examination of the British 1792-94 diplomatic expedition to China, has indicated that Lord Macartney's gifts to the

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1. P.J. Marshall, "An empire of investors", *The Times Literary Supplement*, No. 4716 (20 August 1993), p. 22.
2. P.J. Cain and A.G. Hopkins, "Gentlemanly capitalism and British expansion overseas: I. The old colonial system, 1688-1850," *Economic History Review*, 2nd series, 39 (1986), pp. 501-525.
3. T.H. Breen, "An empire of goods: The Anglicization of colonial America, 1690-1776", *Journal of British Studies*, 25 (1986), p. 476.
4. J.G.A. Pocock, "The limits and divisions of British history: In search of the unknown subject," *American Historical Review*, 87 (1982), pp. 311-336.

Chinese emperor demonstrated a British commitment to scientific and technological progress.[5] D. Mackay has demonstrated the imperial, intellectual, and commercial opportunities incurred by the British through extensive overseas exploration in the late eighteenth century.[6] A.W. Crosby offered a fresh interpretation of European expansionism based on what he referred to as "ecological imperialism". He argued persuasively that the success of European empires had less to do with superiority in arms, organization, or fanaticism, and more to do with biological and geographical factors.[7] Each of these historians, regardless of the specific topic of their research, is examining non-traditional aspects of empire. What is more, they are using relatively new and unconventional techniques in interpreting historical events. These historians have stepped outside of the traditional boundaries of the field of study and are engaged in what can be referred to as interdisciplinary historical research.

This thesis, both in topic and organization, is in keeping with recent trends seen in studies of imperial history. It does not take a conventional, chronological approach to Sir Joseph Banks' involvement with the British Empire. Rather, it is an interdisciplinary work that views imperial history as a series of multi-institutional, trans-territorial, and cross-cultural interactions. The emphasis upon commercial biology is a new, and largely unappreciated, avenue by which imperial expansion can be explored and interpreted. The examination of the importance of commercial biology to the British Empire provides the opportunity to investigate interactions between many aspects of economic, scientific, territorial, military, political, and nationalistic values.

In considering Banks' role in the British Empire it has proved impossible to restrain consideration of his significance to a narrow field. Simply stated, Banks was too big. His influence within British society was, to say the least, huge. His communications cut across all social levels: he conversed with captains of smuggler ships, foreign intellectuals, and

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5. A. Peyrefitte, *The Immobile Empire* (New York, Alfred A. Knopf, 1992).
6. Mackay (1985).
7. Crosby.

royalty equally. Upon Banks' return to Britain, following the *Endeavour* voyage, his name (with that of Cook) was a household word. By the late 1780s a letter from Banks could initiate a series of events that would end with the organization of an expedition to be sent on a voyage across the globe. Banks' influence involved so many aspects of the British Empire that an interdisciplinary study is the only means by which the true extent of his importance to British imperial expansionism can even begin to be appreciated.

Banks' involvement with commercial biology and the British Empire is the focus of this thesis. As such, scientific, social, political, military, and economical factors have had to be considered: it is an interdisciplinary study of a field which had previously been largely ignored. However, there are many other aspects of Banks' influence that can be interpreted using an interdisciplinary mode of investigation. Consideration of Banks' influence with such ventures as the Macartney mission to China or his negotiations for the release of prisoners of war could be examined in an interdisciplinary context. What, for example, were the social ramifications of a scientist stepping outside of his traditional role and into the international political realm? Did Banks' involvement in political negotiations enhance or hinder mainstream British diplomats and politicians? How did newspaper and magazine articles portray Banks' involvement with affairs of state and what does this suggest about class values and expectations? Banks is an untapped reservoir of insights into the workings of British imperial expansion and development. Further study of his copious correspondence and interactions with some of the most significant historical people and events of his time will only serve to enhance an appreciation of the British Empire during the late eighteenth and early nineteenth centuries.

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